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ANDREA PALLADIO

BORN IN VICENZA, 1508. DIED 1580. ARCHITECT OF PALACES BARBARANO, DEL CONSIGLIO, AND CHIERIGATI, VICENZA; AND CHURCHES SAN FRANCESCO DELLA VIGNA, SAN GIORGIO MAGGIORE, AND IL RENDENTORE, VENICE

THE BRICKBVILDER

VOLUME XXV AUGUST, 1916 NUMBER 8

Recent Domestic Architecture from the Designs of John Russell Pope.

By H. D. SMITH.

THE publication in this issue of four brick houses from the current work of Mr. John Russell Pope is interesting at this time, following so closely upon the presentation for public consideration of the new great classic Temple of the Scottish Rite in Washington and the Tudor house of Mr. Stuart Duncan at Newport. These houses for Mr. George Hewitt Myers at Washington, Mr. James Swan Frick at Guilford, Baltimore, Md., Mrs. Arthur Scott Burden at Jericho, Long Island, and Mr. Ogden L. Mills at Woodbury, Long Island, respectively, have been produced contemporaneously with the two larger commissions which have already attained such marked popularity in the profession.

It is readily apparent that similar feeling, both in conception and execution, has dominated all of these efforts. It is that peculiarly characteristic feeling which has dominated all of Mr. Pope's work, that feeling which is given by a close and intelligent study of precedent, taking the good and leaving the ill fitted, making precedent serve to a purpose and not becoming enslaved to it.

These four houses are easily classed with the residences of Mrs. S. R. Hitt and the Hon. Henry White in Washington, which preceded them by a few years. They recall the notes of that English style of the Adam Period, and are carried out in detail likewise influenced by the refinement found in the best of Italian Renaissance.

Requirements and conditions for large private residences to-day are so many and so varied, so delicate and so complicated, that the use of precedent must be carefully and painstakingly guarded in order that the real uses and conveniences of buildings are not subserved to general scheme and appearances.

Fault was found with the buildings of the very period of English work which have given the inspiration and which have more or less influenced the design of these four houses. The architects of that period were enamoured of the Roman and Renaissance precedents, their symmetry and grandeur, to the exclusion of comfort and convenience.

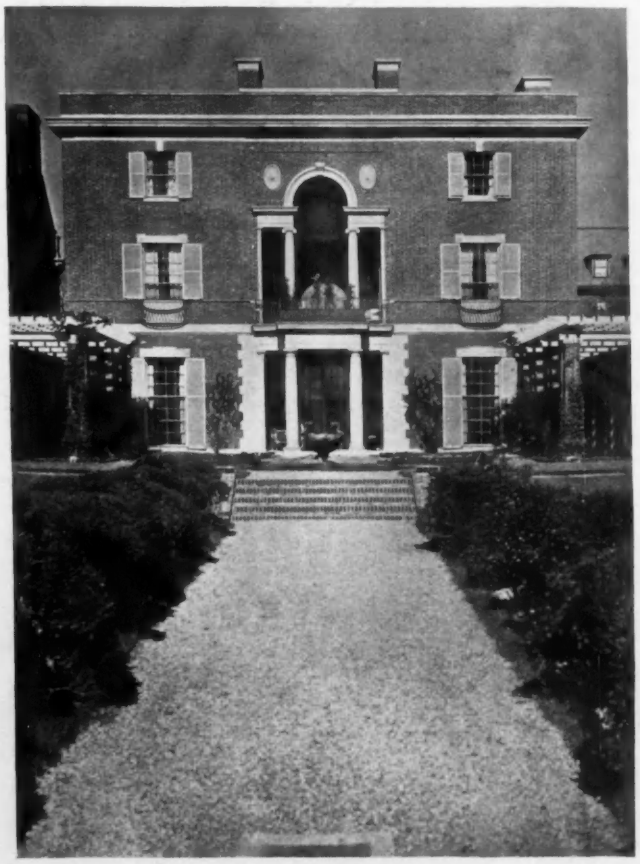
One of their contemporary poets remarks:

> "'Tis very fine,
> But where d'ye sleep, or where d'ye dine?
> I find by all you have been telling
> That 'tis a house, but not a dwelling."

and Lord Chesterfield is said to have remarked that General Wade would better have taken a lodging opposite his Palladian mansion if he liked nothing save its front.

The charm, the character, and the interest in these four houses would avail but little if their owners felt constrained to live opposite in order to enjoy the beauties of their façades.

In these houses the architect has absorbed himself in creating architecture which is at once dignified and capable of forming a convenient and comfortable background for the persons who are to make them their dwelling places. And as dwelling places they have been developed through a period of study which did not end



View from the Garden
House of George Hewitt Myers, Esq., Washington, D.C.

with the completion of a set of drawings, but which continued through the working period of construction and is not even ended when the owners are carefully housed within them, but continues, studying with them the minutest details which make for distinctive habitations.

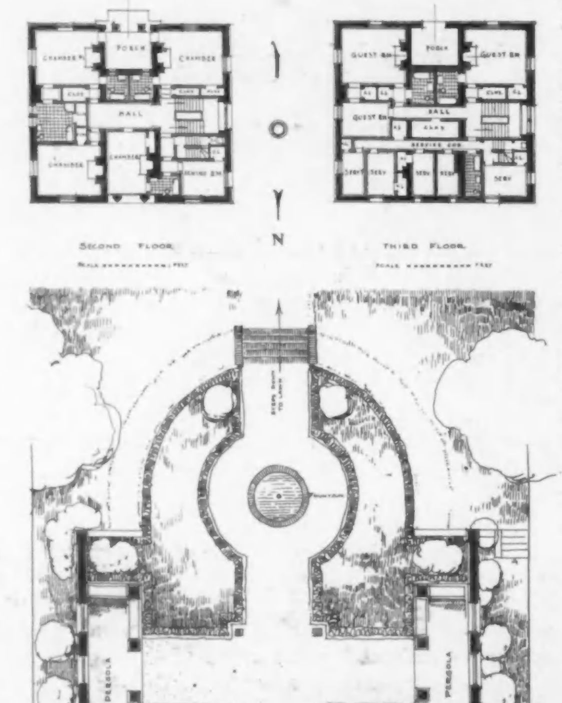
To this end the study of his clients' characteristics, needs, and conditions are Mr. Pope's first consideration, and his attitude has been one of helpfulness in creating an atmosphere of simple domesticity without sacrificing largeness of scale or the charm of dignity. This has the natural result of creating houses which are lasting in their quality of charm, and not of the faddist styles which might attract us to-day, but which are despised or forgotten to-morrow. They are houses which wear well, houses which time and age improve, and in which atmosphere continues to grow with no fear of becoming monotonous.

THE HOUSE FOR MR. GEORGE HEWITT MYERS.

The house for Mr. George Hewitt Myers in Washington, with its Palladian motive, shows more Italian influence than any of the other three. Externally, the charm is due not only to grace of proportion of void and solid, but also to delicacy of profiles, projection, and carving. The double story Palladian motive on the garden façade is most successful in that it furnishes a very pleasant loggia on the first floor and gives on the main bedroom floor a spacious sleeping porch, a very happy solution of a problem which has whitened so many temples and furrowed so many brows.

It well befits a private house in the city not to invite the passerby with its openness. The entrance is just on S street, but the street is shut out directly upon entering the hall by solid doors. The vista is immediately open, however, out through the loggia and into the south garden, where are the pergolas, the gravel paths, the fountain, the terraces, and the lawn.

As in all of these houses, the hall has a solidity and permanence given by marble floors. The plan is very direct. The stairs lead directly off to the west and are of fine Colonial detail, studied to be free from any disturbing curve of line. The halls are of wood paneling painted old ivory white.



Plans of House and Garden
House of George Hewitt Myers, Esq., Washington, D. C.

The drawing room and library, the latter hardly more than a book lined alcove off the former, are done in simple veined Italian walnut. The dining room is in oak with a delightfully carved chimney piece in limestone. The study is in natural cedar, in the panels of which are hung part of a large and interesting collection of Chinese prints.

A great deal of atmosphere is given to the house by the collection of Oriental rugs with which Mr. Myers has surrounded himself.

The outside service for Mr. Myers' house is accommodated in a building on the rear of the property facing Decatur street near Massachusetts avenue, which is on a much lower level than the south garden. This allows the terrace to extend over the roof, and those accessory parts of heating plant, garage, and storehouse are not in view from the house and its pleasant little garden.

HOUSE FOR MR. JAMES SWAN FRICK.

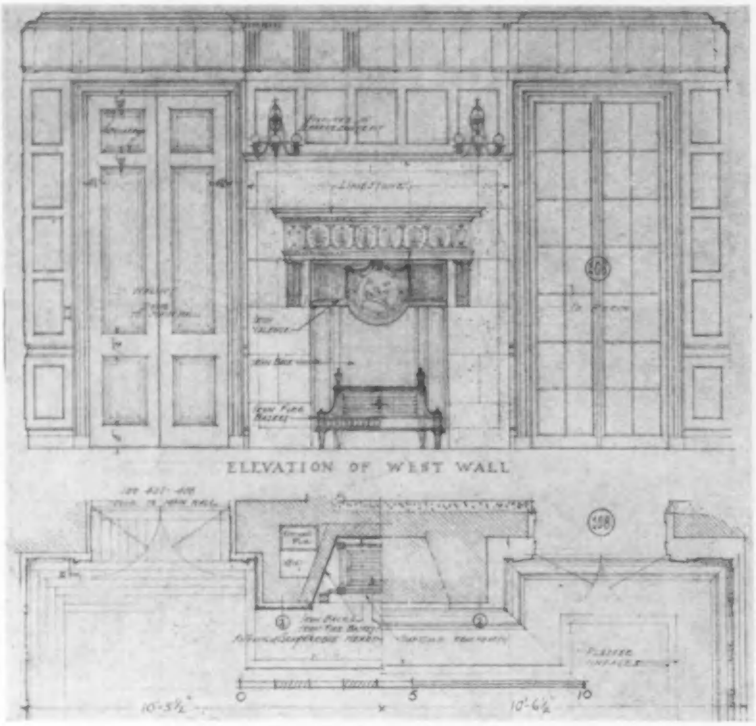
Freed from the restrictions of the city lot, the house for Mr. James Swan Frick at Guilford, Baltimore, stands in a grovelike plot at the head of one of the pleasant avenues of Roland Park. The south façade bends intimately into the grove with a quiet dignity and strength which one finds in the old southern Colonial mansions. The north façade with its recessed entrance and tall, slender columns is strongly reminiscent of that old Polk mansion which has been so much admired for its queer, quaint *naiveté*, but whose proportions are seldom met with in modern work.

The doorways are both big in scale and refined in detail, but are subordinated as details of a scheme which depends so entirely upon the careful study of proportion of mass and outline, of void and solid, of light and shadow, as to make ornamentation superfluous. The subtlety of pilaster and brick projection, the sharpness and squareness of the cornice, its projection and depth, and the

ELEVATION AND VIEW OF STREET FRONT

HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT



Detail of Fireplace Side of Dining Room
House of George Hewitt Myers, Esq., Washington, D. C.

height of the upper parapets are accurately proportioned to the height of the building and to its length.

The materials used are brick and painted wood trim. Second quality bricks were insisted upon to insure a certain unevenness of texture which must be obtained to overcome the painfully careful workmanship of the conscientious mechanic. The wood is of cypress, a wood which will withstand the friendly assaults of the weather even when mellowed by being deprived of some of the protection of the first coats of even and glaring white lead paint.

The twin roads of Charlcote Place allow access on either side of the north front. The gravel forecourt lies square in front of the house, walled at the back with the garage, plain and of most pleasing proportions, with just a playful note of lattice marking the small pool opposite the entrance door of the house.

The entrance and stair halls are very architectural and precise in treatment. The detail is very much in the queer character of the Greek Revival, such as marked an interesting period of our Colonial work. The color is a warm gray, toned and glazed to an old stone finish. What ornamental detail there is in the cornice above the damask covered walls of the drawing room and in the library, done in walnut with touches of old gilt, even tastes of the period of the Empire -- an influence also felt in a certain period of our Colonial design.

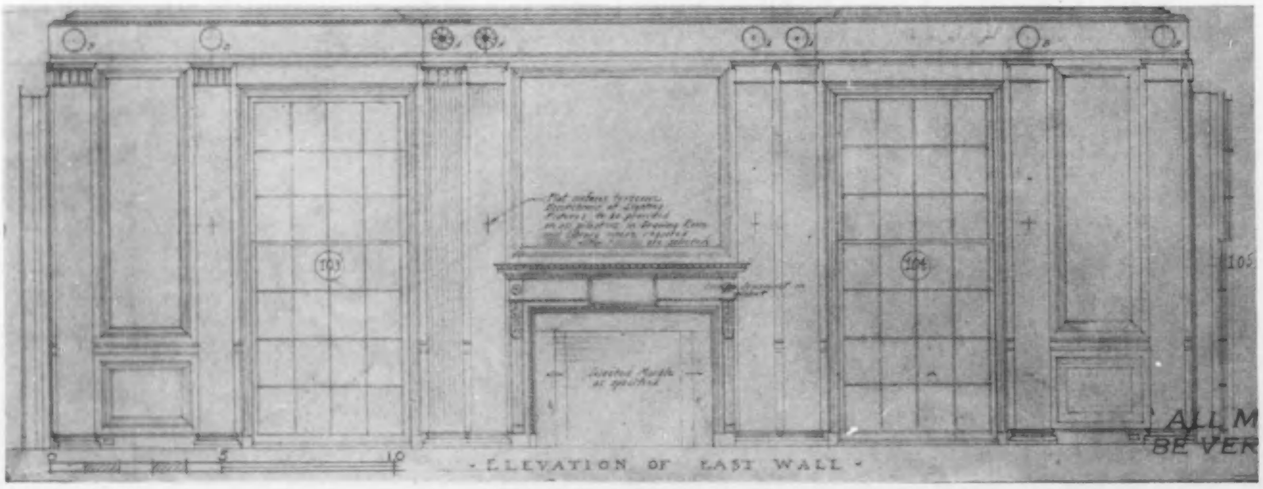
The mantels of the three large rooms, as well as those in the reception room and Mr. Frick's office, have the sentimental value of having been taken from Mr. Frick's former Colonial mansion in Baltimore, which he gave up to take this homestead which breathes the atmosphere of a century ago, but which is so beautifully adapted to his needs of to-day and to-morrow.

COUNTRY HOUSE OF MRS. ARTHUR SCOTT BURDEN.

Michael Angelo's philosophy about his sculpture was that every piece of marble with which he worked had something good created in it, and that his task consisted in merely chipping and chiseling away the unnecessary bulk of material and exposing the beautiful or powerful something which the block contained.

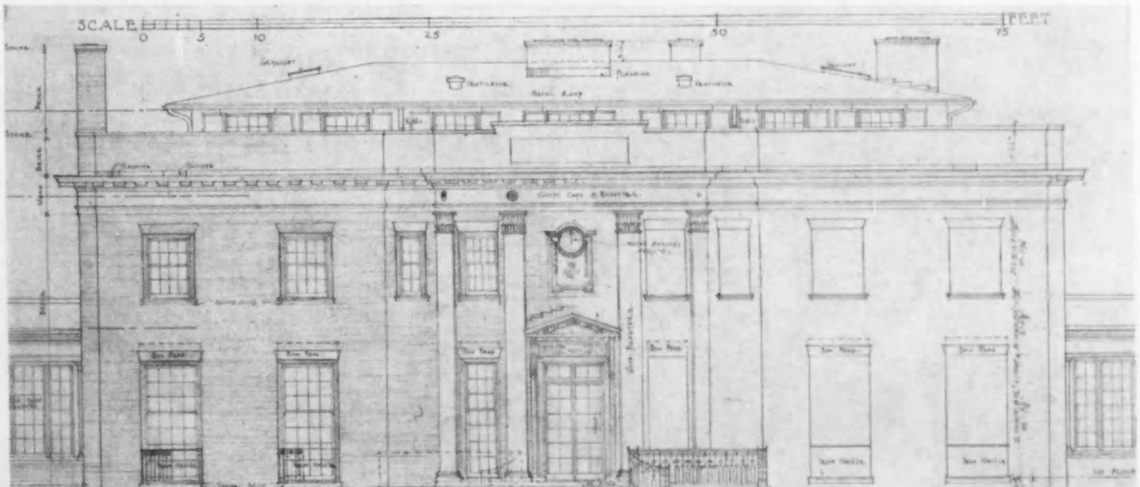
To any one who had seen the wooded thicket on the high part of the seventy-acre plot of Mrs. Arthur Scott Burden in the midst of the Jericho colony on Long Island, the existing creation of house, gardens, loggias, service buildings, roads, courts, lawns, and paths would suggest the old idea of the master sculptor.

There in the edge of the woods, spreading out comfortably over the ground surrounded by its flowers and shrubs and vines and old trees, and approached by its simple



Detail of Fireplace Side of Drawing Room
House of George Hewitt Myers, Esq., Washington, D. C.

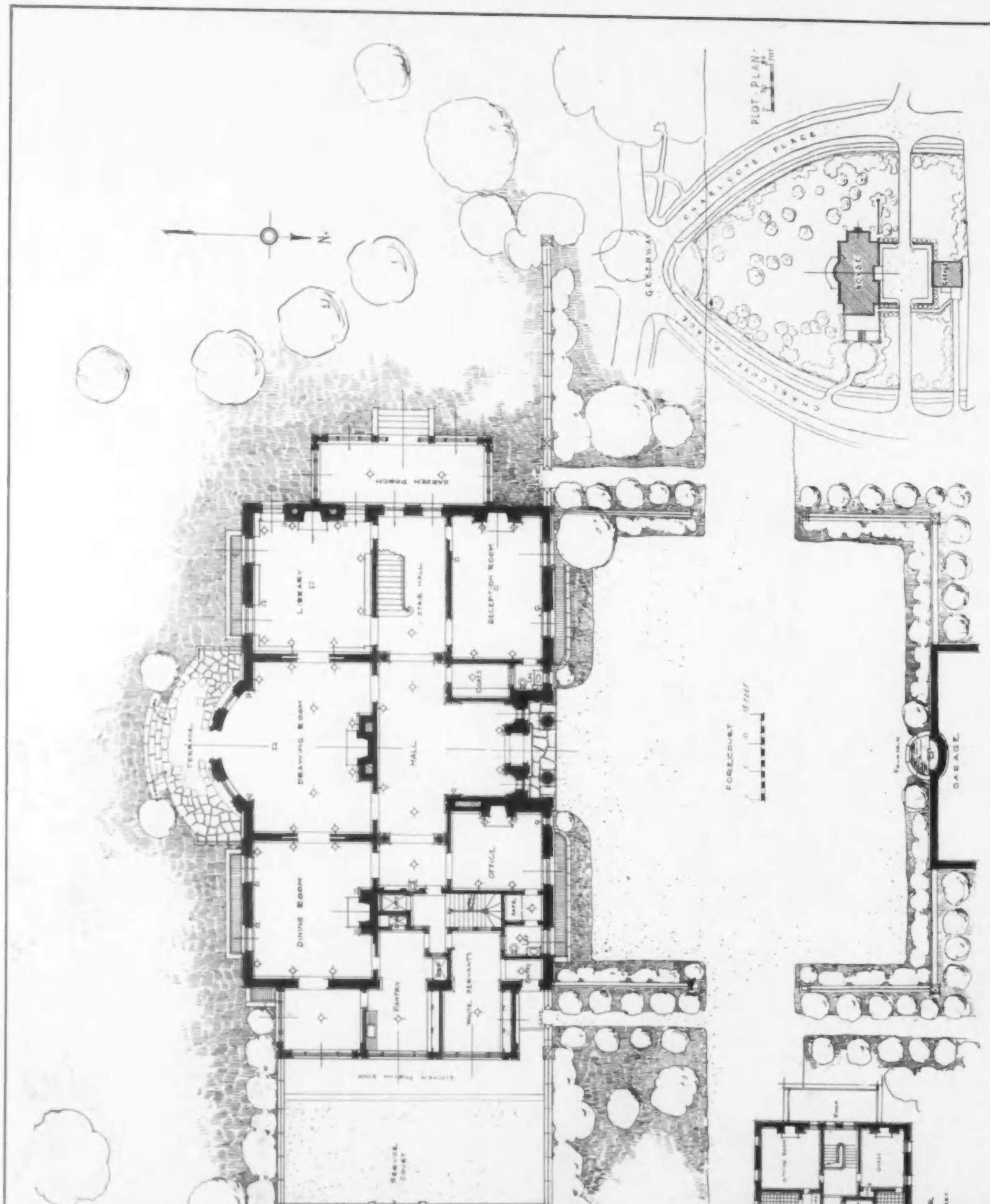
VIEW OF SOUTH FRONT



ELEVATION OF SOUTH FRONT

HOUSE OF JAMES SWAN FRICK, ESQ., GUILFORD, BALTIMORE, MD.

JOHN RUSSELL POPE, ARCHITECT



HOUSE OF JAMES SWAN FRICK, ESQ., GUILFORD, BALTIMORE, MD.
JOHN RUSSELL POPE, ARCHITECT

winding roadway through the woods at the back, seems always to have been this old English manor house. It has all the marks of privacy and intimacy which one dreams of as making a home in the country, away from all that he wants to be away from, and surrounded with all he wishes to be surrounded with.

These marks of privacy and intimacy are not fanciful, but are real and distinguishable. The satisfying graciousness of the front door, with its touch of wrought iron softened by the masses of Dorothy Perkins roses ; the complete frankness of the large windows which show the floor level but inches above the grass ; the slenderness of the decorated pilasters which rise from the grass and out of the planting to embrace the windows of the chamber floor — these are marks of intimacy. The winding of the road through the old apple orchard and the woods of oak, locust, elm, and dogwood ; the high garden walls of brick over which the tops of porches appear ; the long walls of stone with the suggestions of formal planting appearing above — these are marks of privacy.

In line and mass Mrs. Burden's house is very different from that of Mr. Frick at Baltimore, but the details are of very similar nature, and the underlying principle of utmost simplicity has governed both creations. Both have the graceful, floral capped pilaster order, which, being purely decorative in motive, depends entirely upon its proportion for its *raison d'etre*. Both have the square, sharp-looking cornice with flat, mutule-like modillions, and both have the studied parapet in the brick above.

Simplicity is not only a feature of exterior design, but it is also an essential feature of the plan. The north side of the plan is given over to the marble floored entrance and stair halls, a small reception room, and a schoolroom. The other rooms to the south and west, particularly the long living room, are assured of complete privacy and almost seclusion. The service portion is drawn out commodiously, extending to the men servants' pavilion on the extreme east, the niched ends of which balance the loggias of the garden at the west, some two hundred feet away.

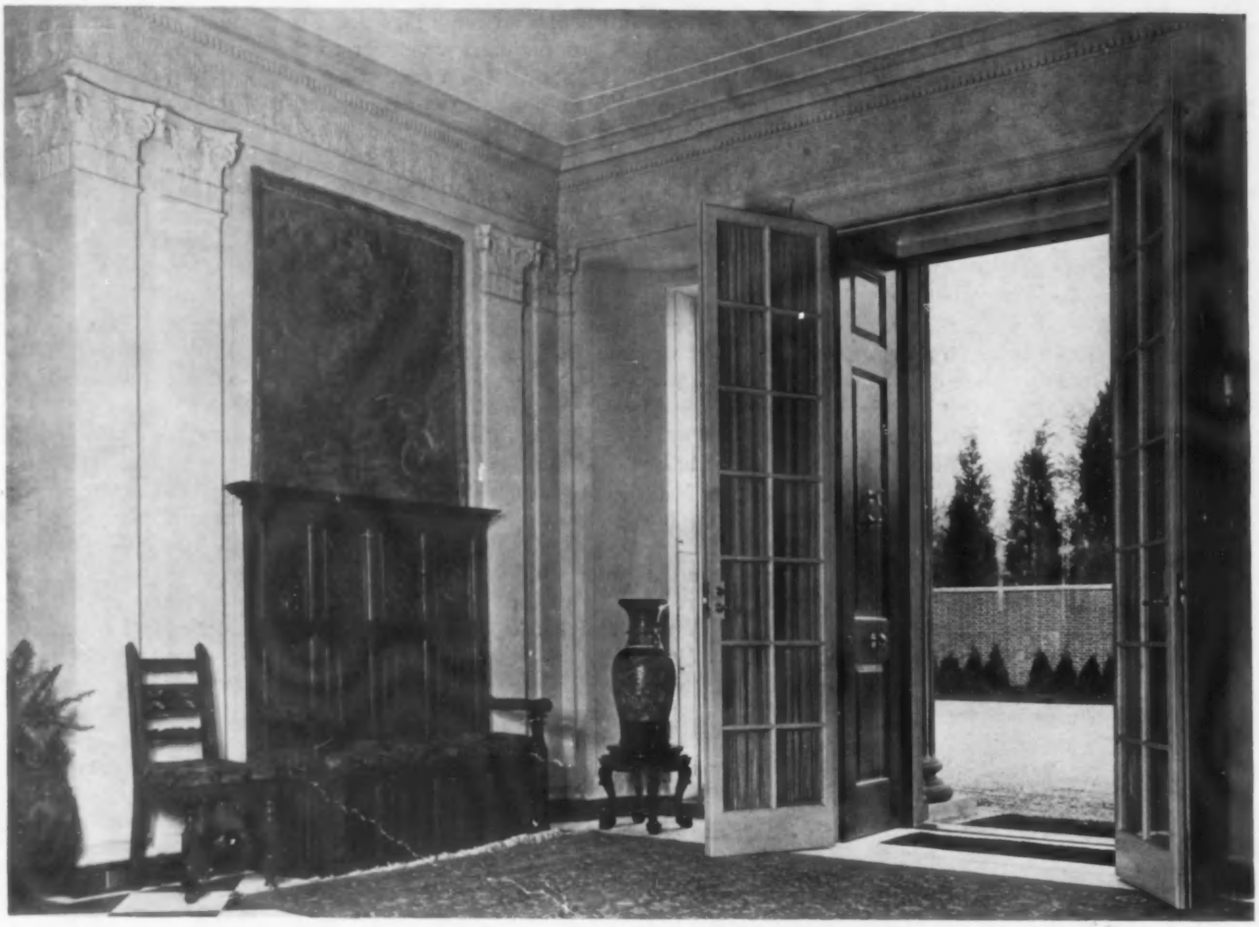
The entrance and stair halls are painted hard plaster with detail as of stone, in the fashion of the halls of the fine old London houses of the Adam days ; the walls a rich, thick, cool gray, with slate-colored pilasters and columns marking the openings.

The feature of the plan is the elliptical stair hall, domed at the second story ceiling, with the beautifully executed stair railing of charming thin proportions, touched with tarnished gilt. The merging of the entrance hall into the stair hall by recalling the ellipse on the hall side is particularly happy.

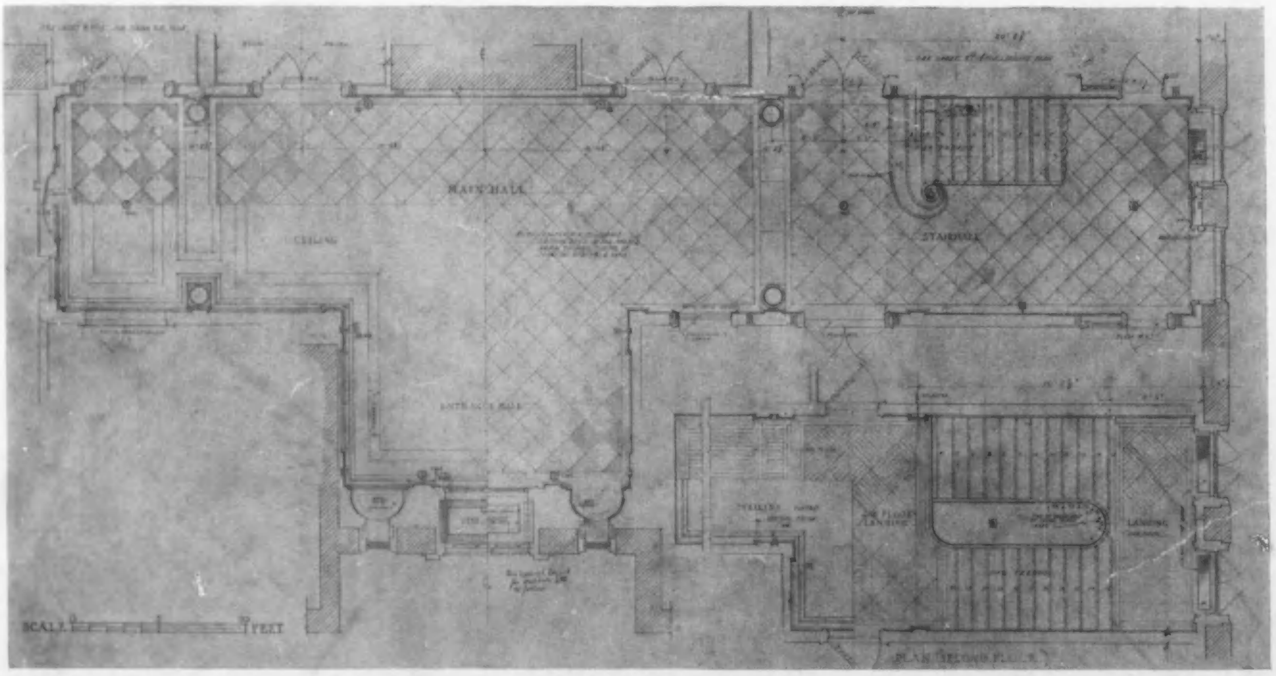
The dining room is given an air of spaciousness by the judicious choice of furniture, ample in size but not large. The room is green, a dark rich olive green, glazed unevenly with soft grays and browns so that it is pervaded with an atmosphere of restfulness. The square little inviting library is all of natural teak. The juxtaposition of books and doors, symmetrically disposed on each wall, under similar elliptical arch motives is interesting.

The large room of the plan, the living room on the

View of Garage and Forecourt
House of James Swan Frick, Esq., Guilford, Baltimore, Md.



VIEW IN HALL LOOKING TOWARD ENTRANCE



DETAIL PLAN OF FIRST FLOOR HALL AND STAIRWAY

HOUSE OF JAMES SWAN FRICK, ESQ., GUILFORD, BALTIMORE, MD.

JOHN RUSSELL POPE, ARCHITECT

southwest corner, is a most successful adaptation of a plain old Georgian room, whose boldly simple mouldings and panels form an adequate background for the rare furniture of the William and Mary period and needlework pieces in which Mrs. Burden is so much interested. The warm mellowness of the yellow walls, aged by wear and many coats of paint and rubbing, lends an atmosphere of color and tone which is hardly appreciated from the illustrations.

Forecourt and Entrance Front
House of Mrs. Arthur Scott Burden, Jericho, Long Island, N. Y.

The dining room, library, and living room open on the south through all their windows to the open lawn, the living room also opens to the west on to the thin ironwork porch which virtually lives as a part of the little flower garden which is flanked by the two white columned loggias.

On lower levels and reached by old fashioned worn flag steps and paths are the rose garden and the pool garden, the planning, planting, and care of which are of such particular personal interest to Mrs. Burden.

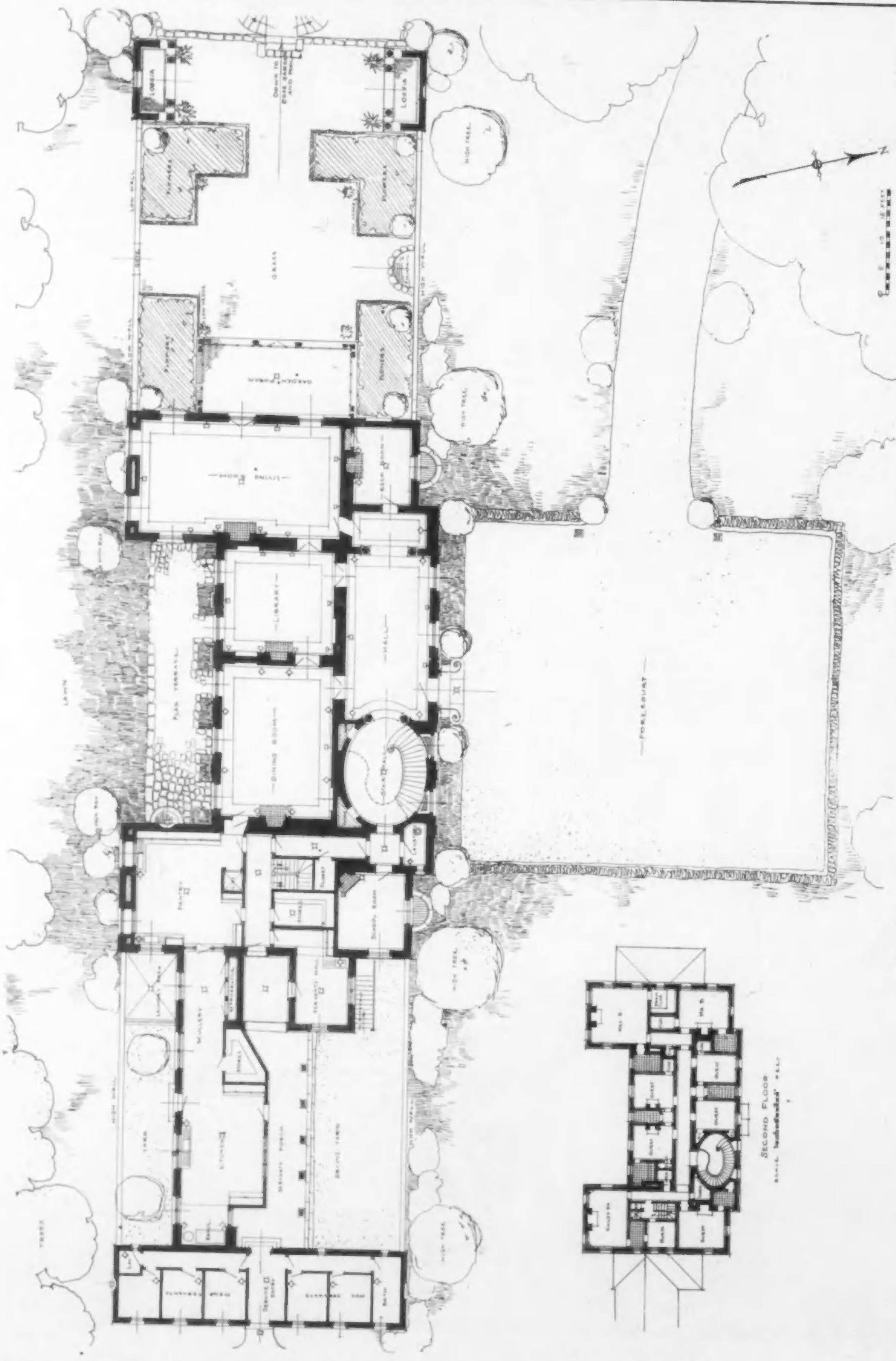
The *ensemble* is altogether lovely, simple, and lasting, and grows in charm and sentiment as it continues to age and be lived in.

THE ESTATE OF MR. OGDEN L. MILLS.

On the estate of Mr. Ogden L. Mills at Woodbury, which lies over toward the north shore of Long Island, Mr. Pope has taken every advantage of contour and natural growth in the placing of an almost monumental country seat. He has spread his architecture over a plateau with views in all directions, and by most ingenious planning he has embraced courts, porticoes, and loggias by wings and walls so that every portion of the house is flooded with light and the good free air of the countryside. He has done this without any appearance of rambling, looseness in mass, or of disconnectedness in plan.

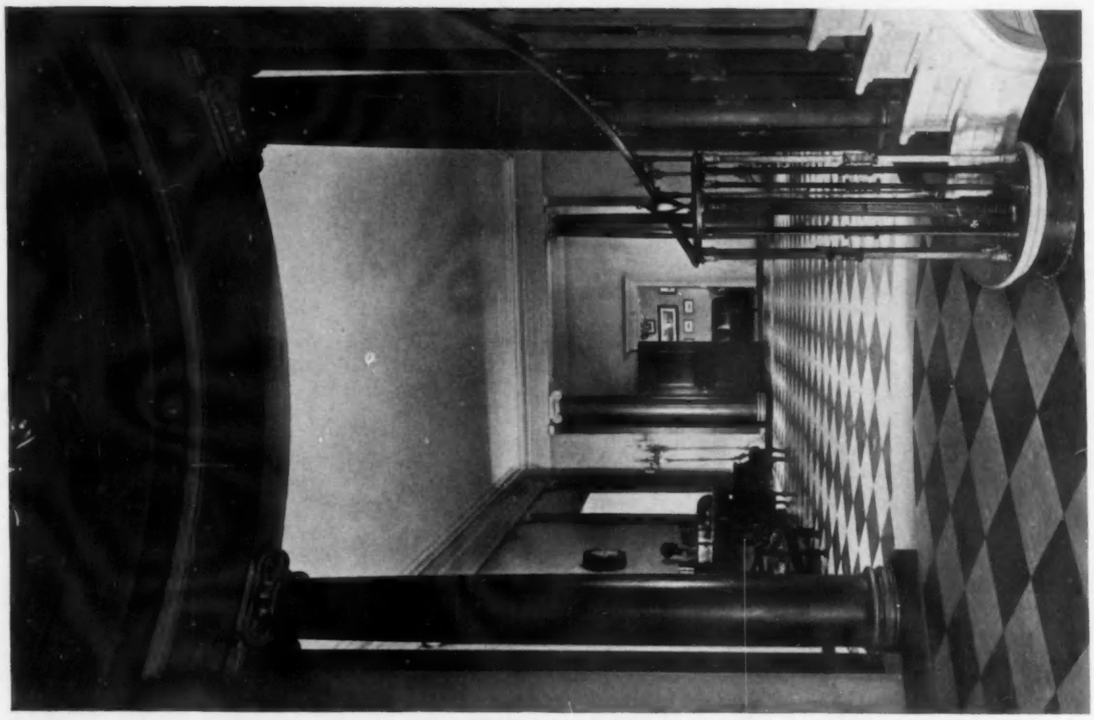
The natural beauties of the site have been supple-

Living Room in House of Mrs. Arthur Scott Burden, Jericho, Long Island, N. Y.



HOUSE OF MRS. ARTHUR SCOTT BURDEN, JERICHO, LONG ISLAND, N. Y.
JOHN RUSSELL POPE, ARCHITECT

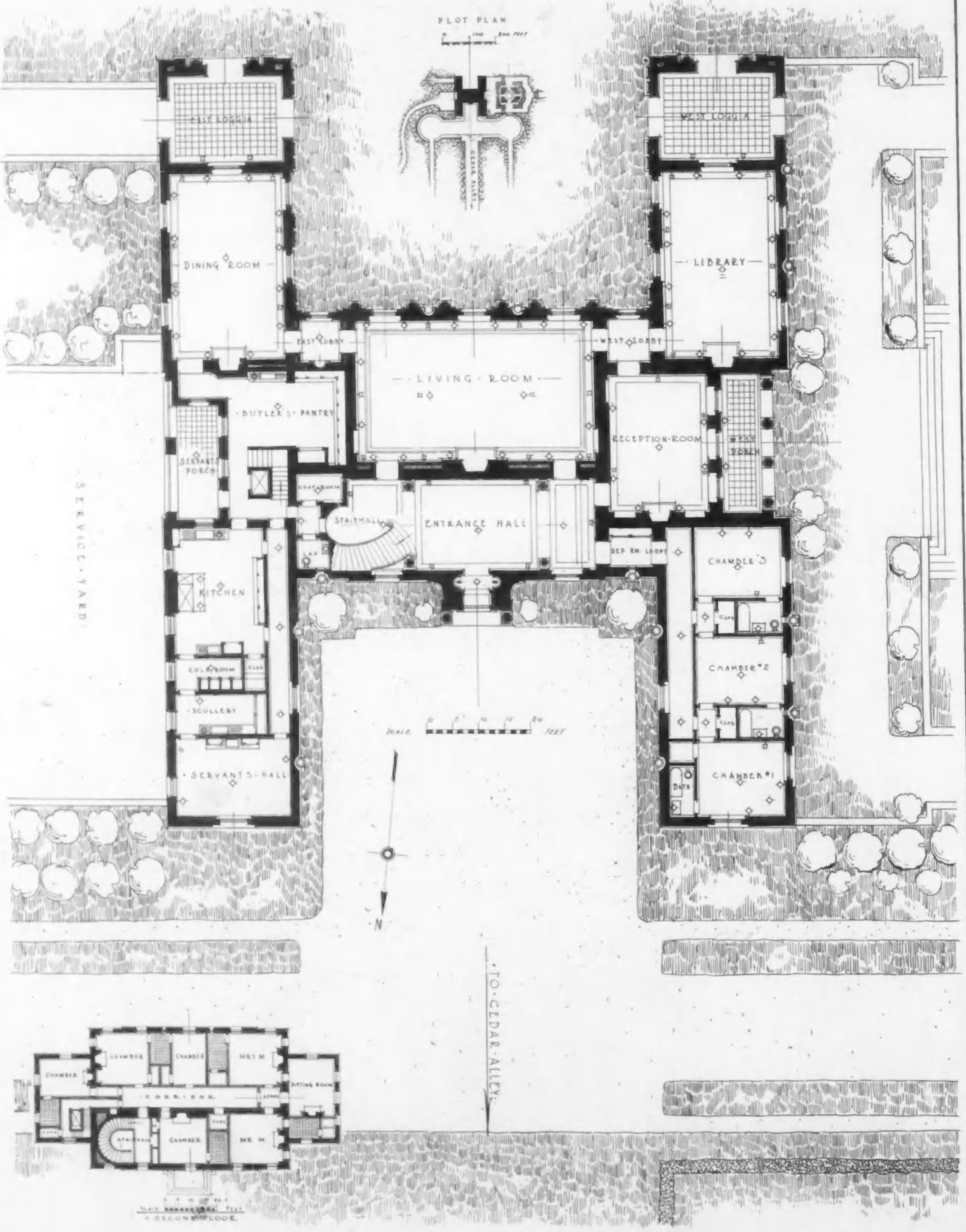
DETAIL OF CORNER OF LIBRARY



ENTRANCE HALL LOOKING FROM STAIR HALL

HOUSE OF MRS. ARTHUR SCOTT BURDEN, JERICHO, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT



HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.
JOHN RUSSELL POPE, ARCHITECT

mented by the making of gardens, and particularly by the open lawned alley of cedars extending north from the house and forecourt, opening the vista to the lake in the lowlands and to the hills of woods beyond. This alley has been made by the transplanting of cedars which were native on the estate. The two large circles in the entrance drive northeast and northwest of the building are also fashioned from these cedars.

Detail of Vase
House of Ogden L. Mills, Esq.

In the building up of its mass this house is probably unique among country houses. The central portion rises through two stories, with its cornice and parapet of somewhat Italian feeling, and is flanked and carefully held in by the well proportioned blocklike wings whose flat fretted cornices carry the line of the first story order around the entire building.

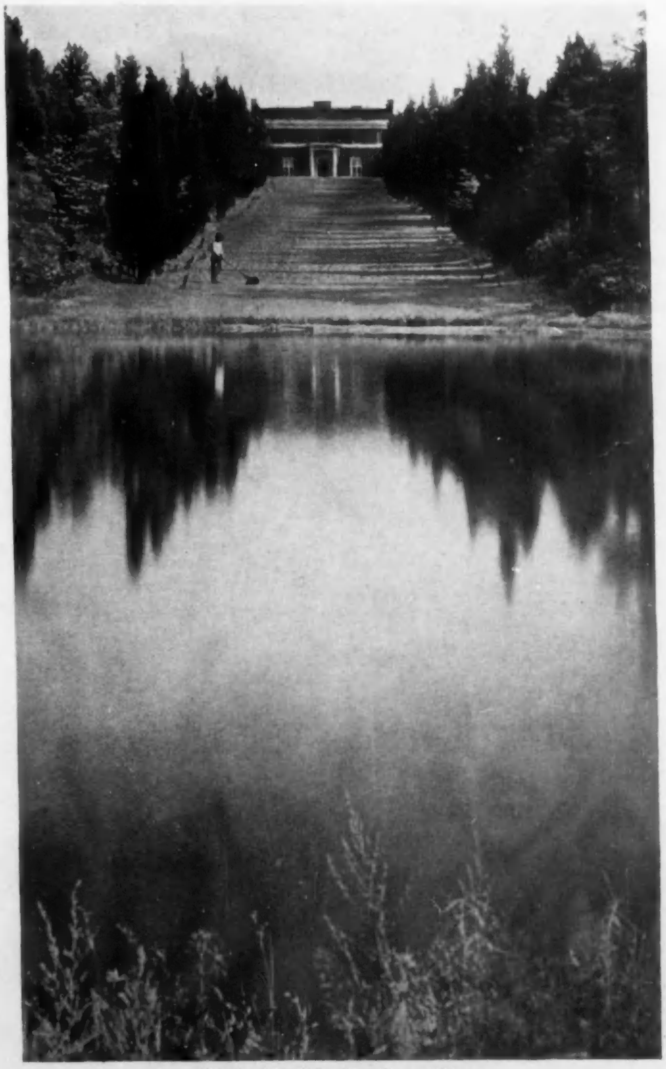
The order is inspired by that used on the Orangerie at Bowood, Wilts. It is used sparingly about the entrance court, but is fairly lavished on the lawn court to the south in the form of columns and pilasters, singly and in pairs. Niches, with urns very Adam-like in conception and execution, with carefully placed plaques of low relief in the same character, are the elements used to supplement the order and the window disposition in making up the composition of the building.

The scheme of entrance and vertical circulation is not unlike that in Mrs. Burden's residence. Through the entrance door made pleasing by the vigorous carving of the surrounding stonework, the hall is entered on the center axis. On the left, and marked by columns as at Mrs. Burden's, is the stair hall extending through two stories. To the right is the entrance to the reception room and the lobby to the guest room wing, which contains three large chambers, each provided with a bath.

The large room of the plan, 28 by 56 feet, extends across the entire south side of the main part of the house and opens out directly upon the court lawn. At the south corners of this room are the little square, interesting lobbies which are small enough to help give the idea of real scale to the rooms they connect. The one to the southwest leads to the library wing, and that to the southeast leads to the dining room wing.

These two rooms, which occupy each an entire wing, open on the inside to the court lawn, and the library opens on the west to the formal flower garden which axes on the reception room and its loggia. These two wing rooms open on to their arched loggias, which form interesting terminal features to both wings.

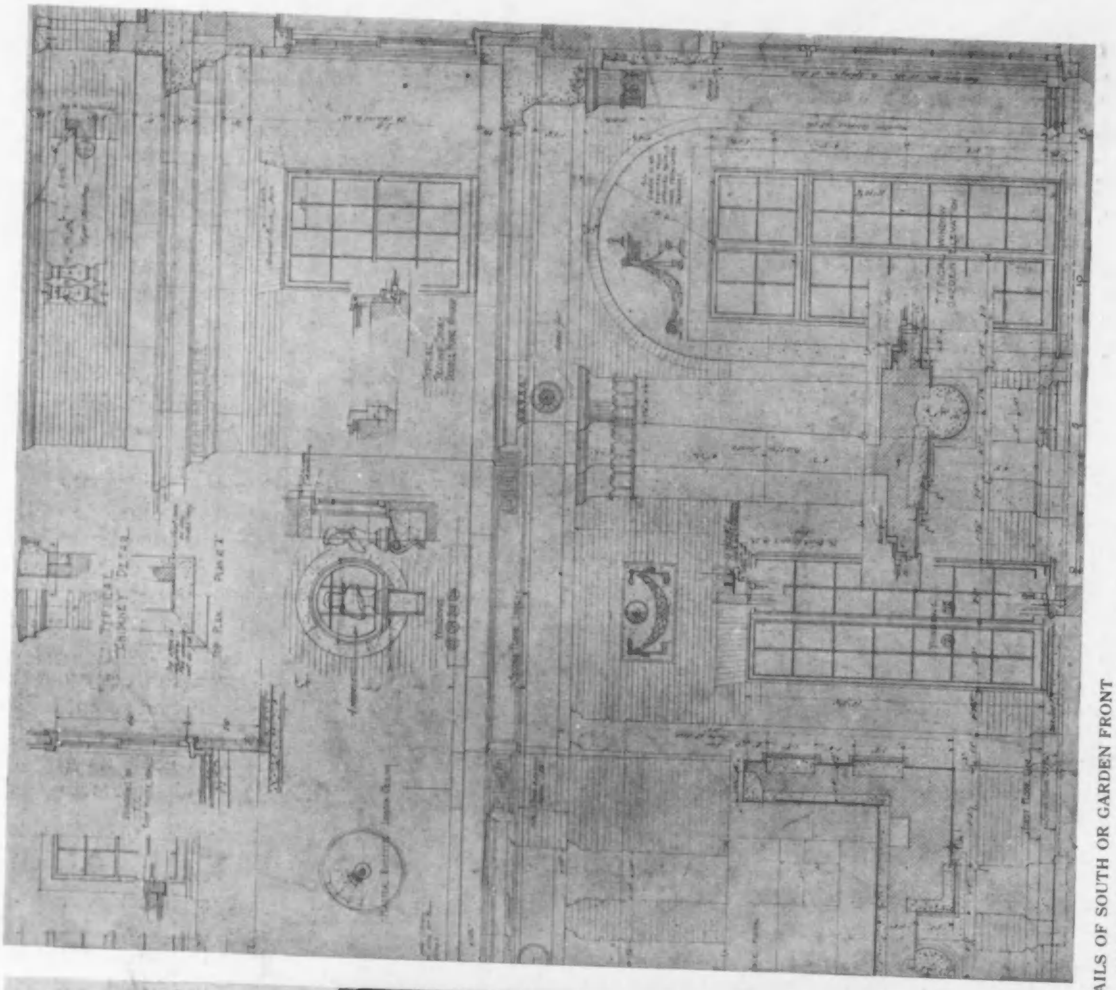
The service requirements are accommodated in the northeast wing which balances the guest room wing on the opposite side of the entrance court axis.

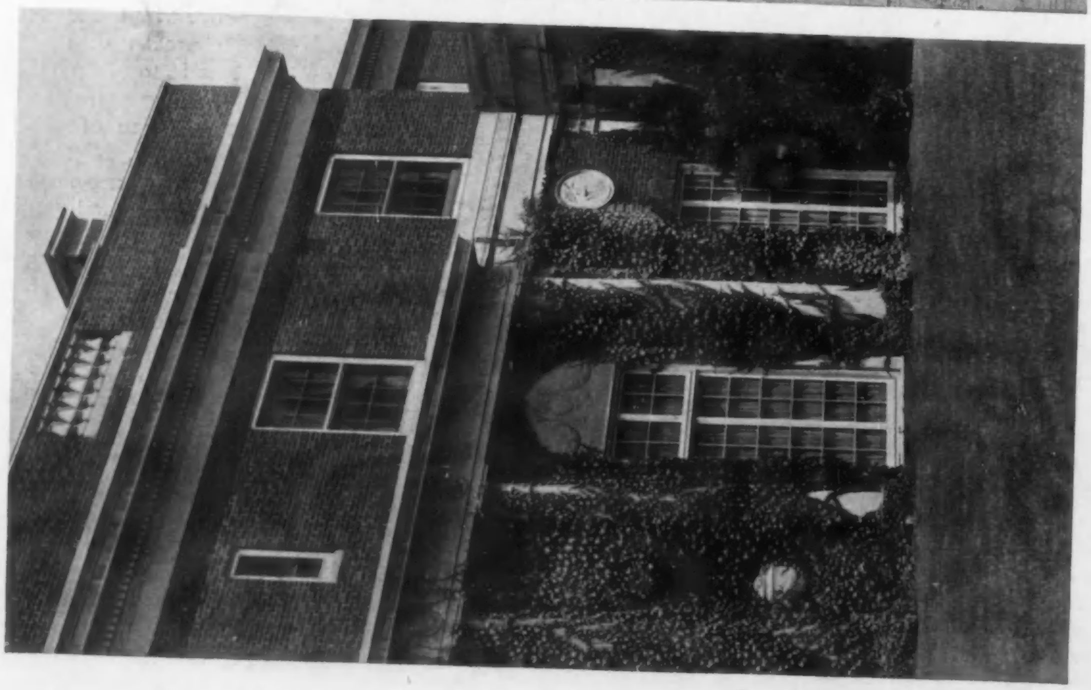


"Cedar Alley" Looking Toward House
House of Ogden L. Mills, Esq., Woodbury, Long Island, N. Y.

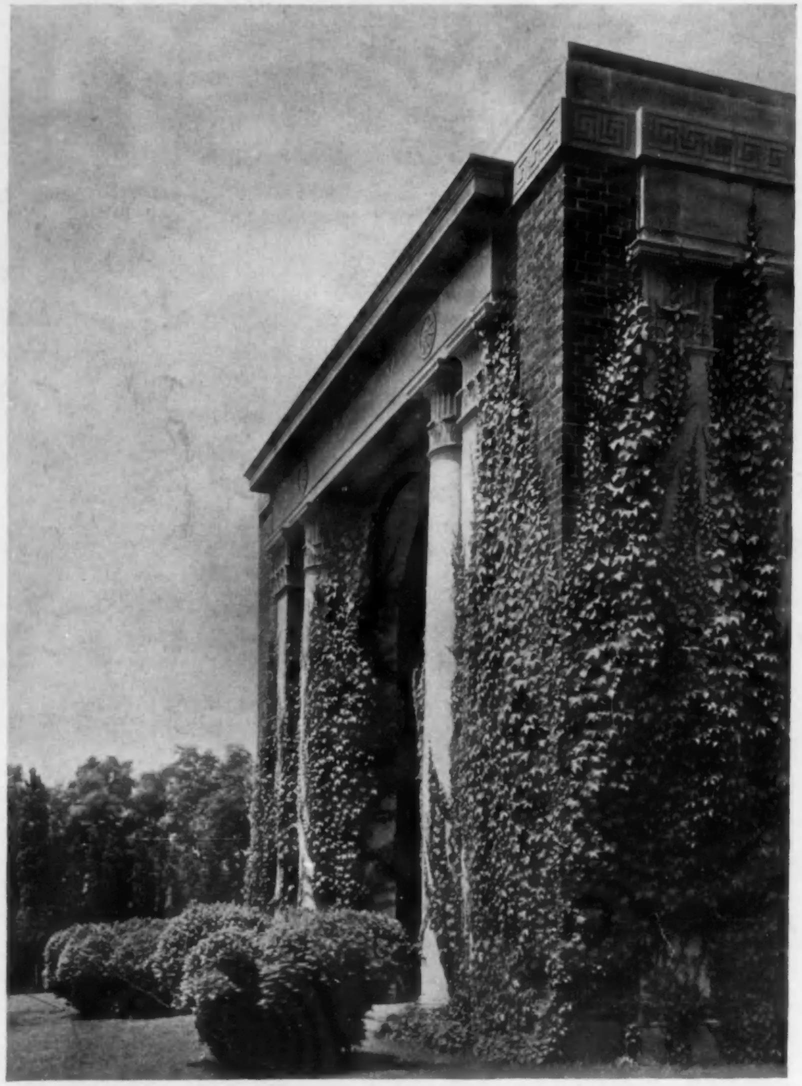
To the west of the house, on the main long axis directly off the reception room, is the formal flower garden with its pool, its grass steps, and box fringed grass paths. Mr. Pope has given this garden just enough of the touch of architecture in the steps, and the brick and stone balustrades, to make it one with the monumental character of the house, and to help hold in proper restraint the exuberance of the floral growths.

The monumental strength and solidity of the entire structure is made intimate by the openness of the large casements and is softened by the masses of vines which the sturdiness of the brick and stone walls seems to invite to grow upon them. It is a house which is large enough and important enough for its magnificent setting, and which is small enough and intimate enough and lovely enough for its owner to use and enjoy as a summer country seat.

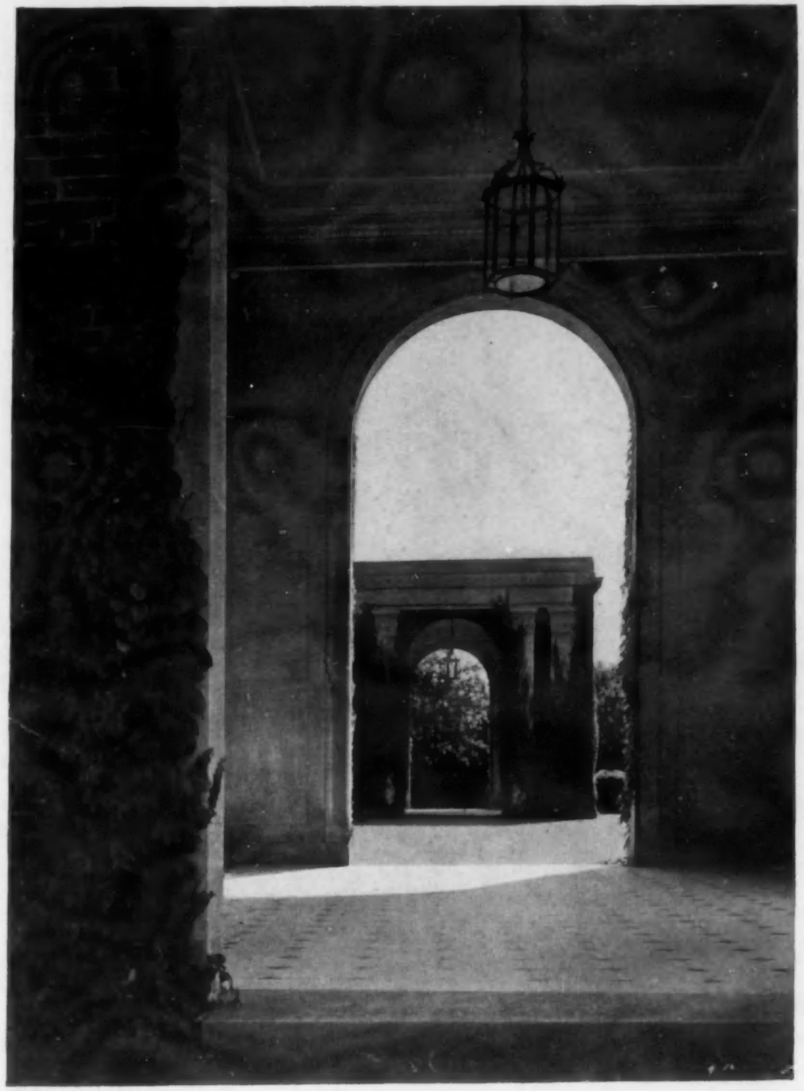




DETAILS OF SOUTH OR GARDEN FRONT
HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.
JOHN RUSSELL POPE, ARCHITECT



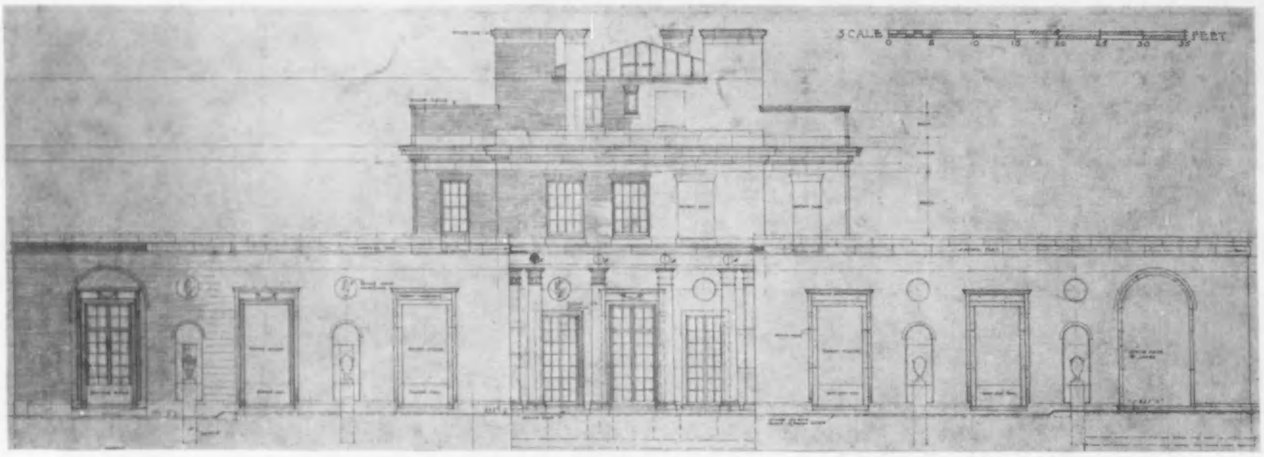
DETAIL OF LOGGIAS ON SOUTH FRONT



INTERIOR OF LOGGIA AND VIEW ACROSS TERRACE

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

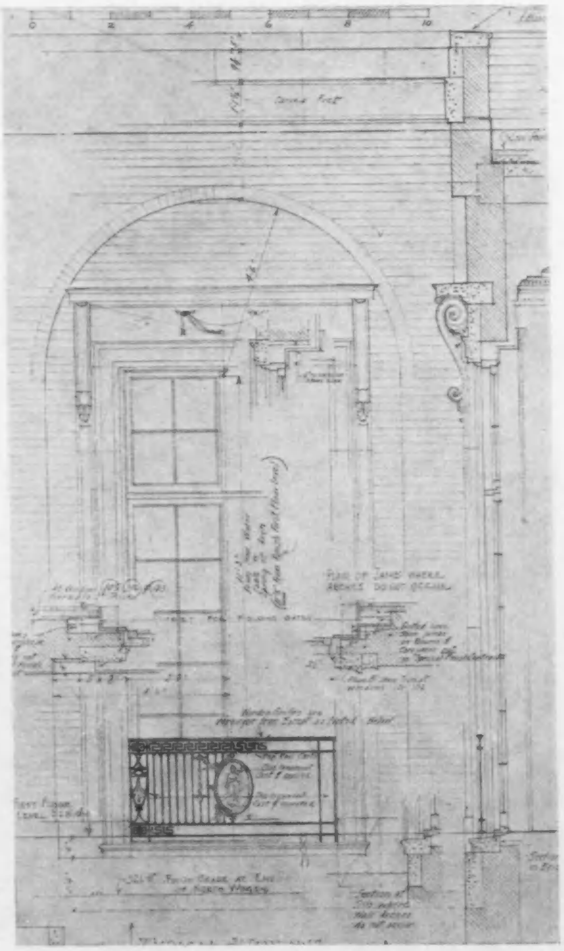
JOHN RUSSELL POPE, ARCHITECT



West Elevation, House of Ogden L. Mills, Esq., Woodbury, Long Island, N. Y.

These four houses, designed for purposes which are manifestly very different and for conditions which represent a wide range of domestic requirements, are singularly uniform in character and decidedly individual in conception and execution. They stand as a credit to their owners. They do not depend upon lavish expenditure of money, nor on the elaborate use of precious materials to command consideration. They represent a maximum of comfort, convenience, and beauty of mass, of line, and of detail with efficiency of execution and a reasonable minimum of cost. As such they surely add to the sum-total of good residence architecture of America.

View of Reception Room Porch on West Side



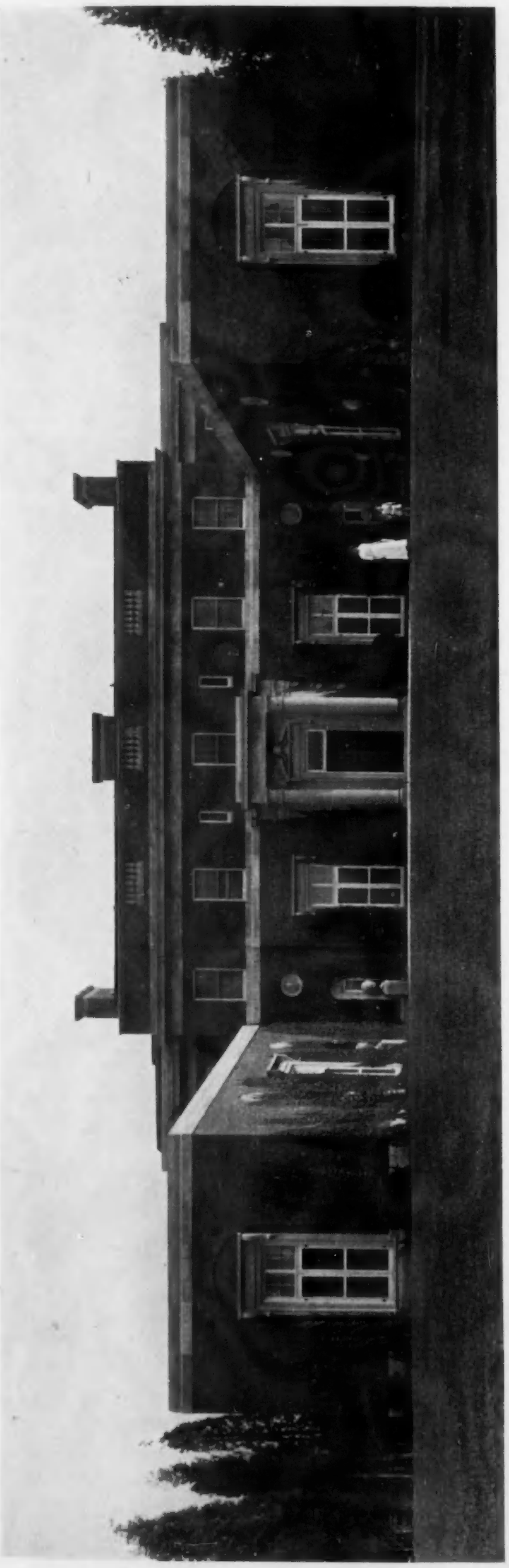
Detail of Windows on West Elevation

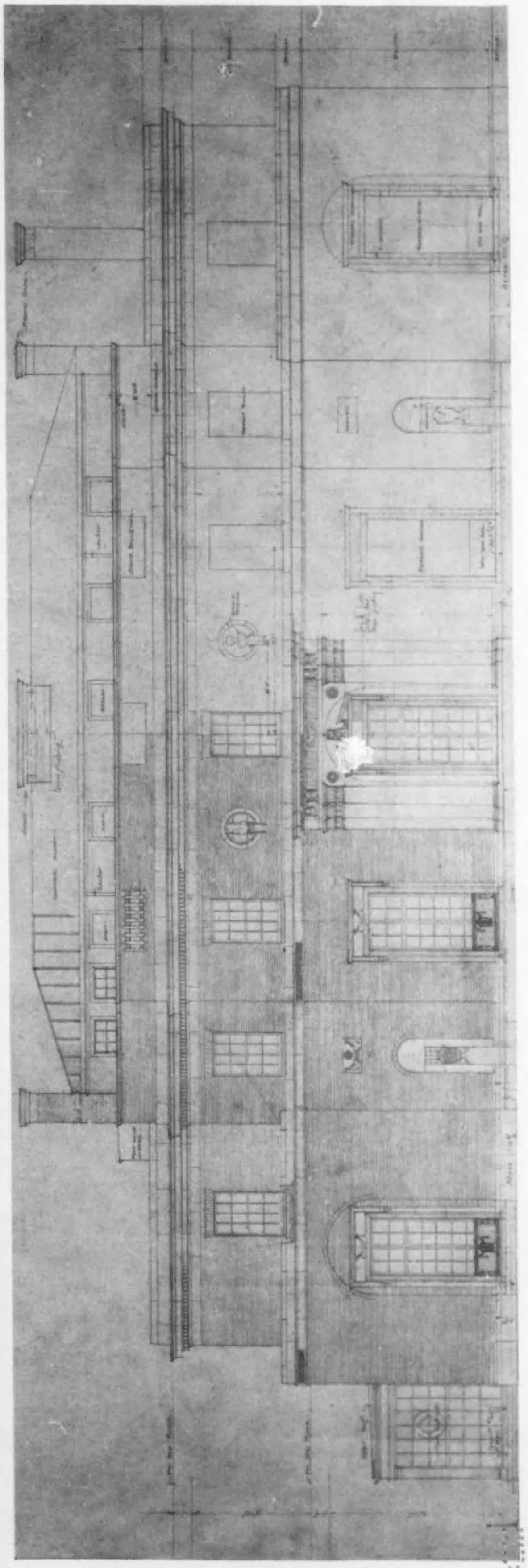
House of Ogden L. Mills, Esq., Woodbury, Long Island, N. Y.

DETAIL OF MAIN ENTRANCE

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT

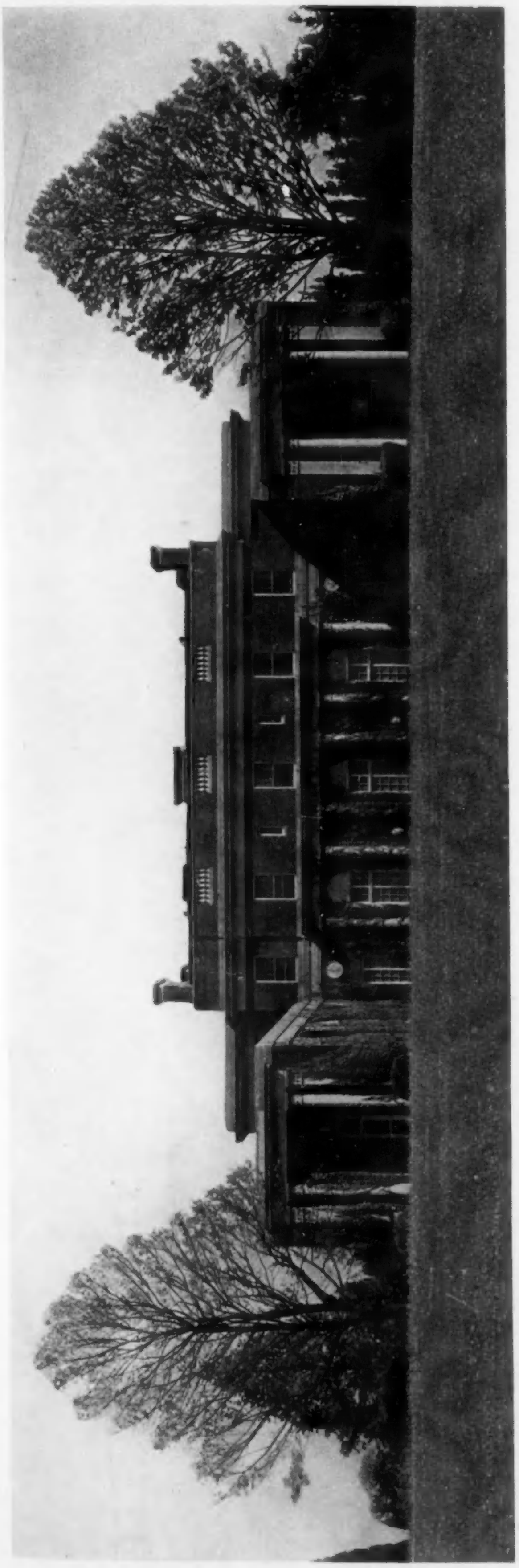


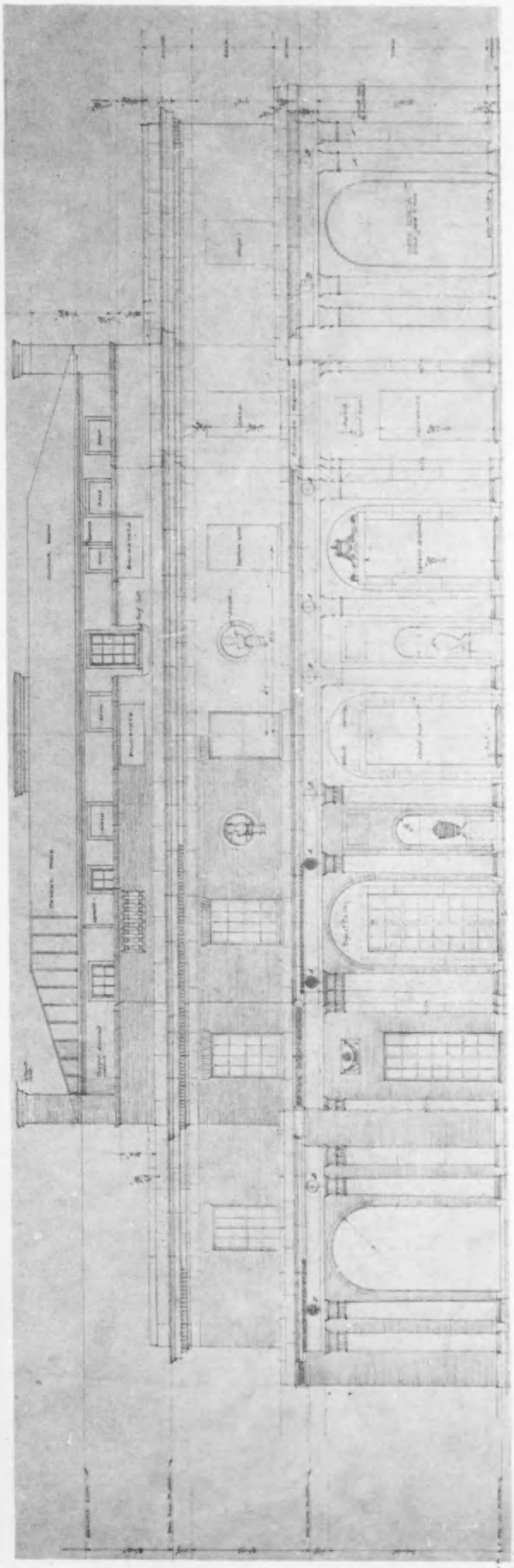


ELEVATION OF THE NORTH OR ENTRANCE FRONT

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT





ELEVATION OF THE SOUTH OR GARDEN FRONT

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT

DETAIL OF SOUTH FRONT

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.
JOHN RUSSELL POPE, ARCHITECT

VIEW OF WEST LOGGIA AND SOUTH COURT

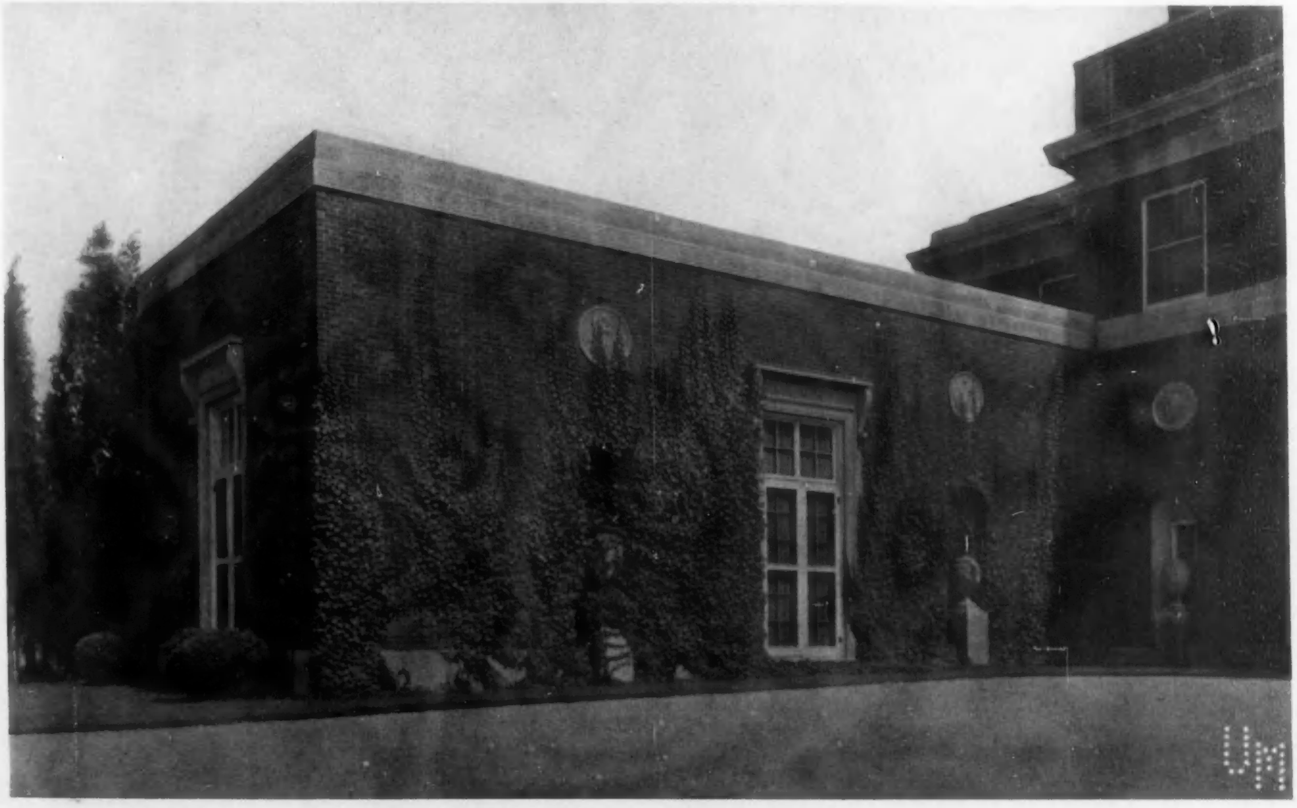
VIEW OF WEST PORCH AND LIBRARY WING

VIEW ALONG TERRACE SHOWING LOGGIAS

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT

VIEW OF LIBRARY WING AND WEST LOGGIA



VIEW OF EAST WING ON ENTRANCE FRONT

HOUSE OF OGDEN L. MILLS, ESQ., WOODBURY, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT

VIEW OF ENTRANCE FRONT

HOUSE OF MRS. ARTHUR SCOTT BURDEN, JERICHO, LONG ISLAND, N. Y.

JOHN RUSSELL POPE, ARCHITECT

DETAIL OF MAIN ENTRANCE

HOUSE OF MRS. ARTHUR SCOTT BURDEN, JERICHO, LONG ISLAND, N. Y.
JOHN RUSSELL POPE, ARCHITECT

VIEW OF GARDEN FRONT FROM THE EAST

VIEW OF GARDEN FRONT FROM THE WEST

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VIEW OF GARDEN AND LOGGIAS FROM THE SOUTH LAWN

VIEW OF THE GARDENS AT WEST SIDE OF HOUSE

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STEPS TO THE ROSE GARDEN AND LOGGIA

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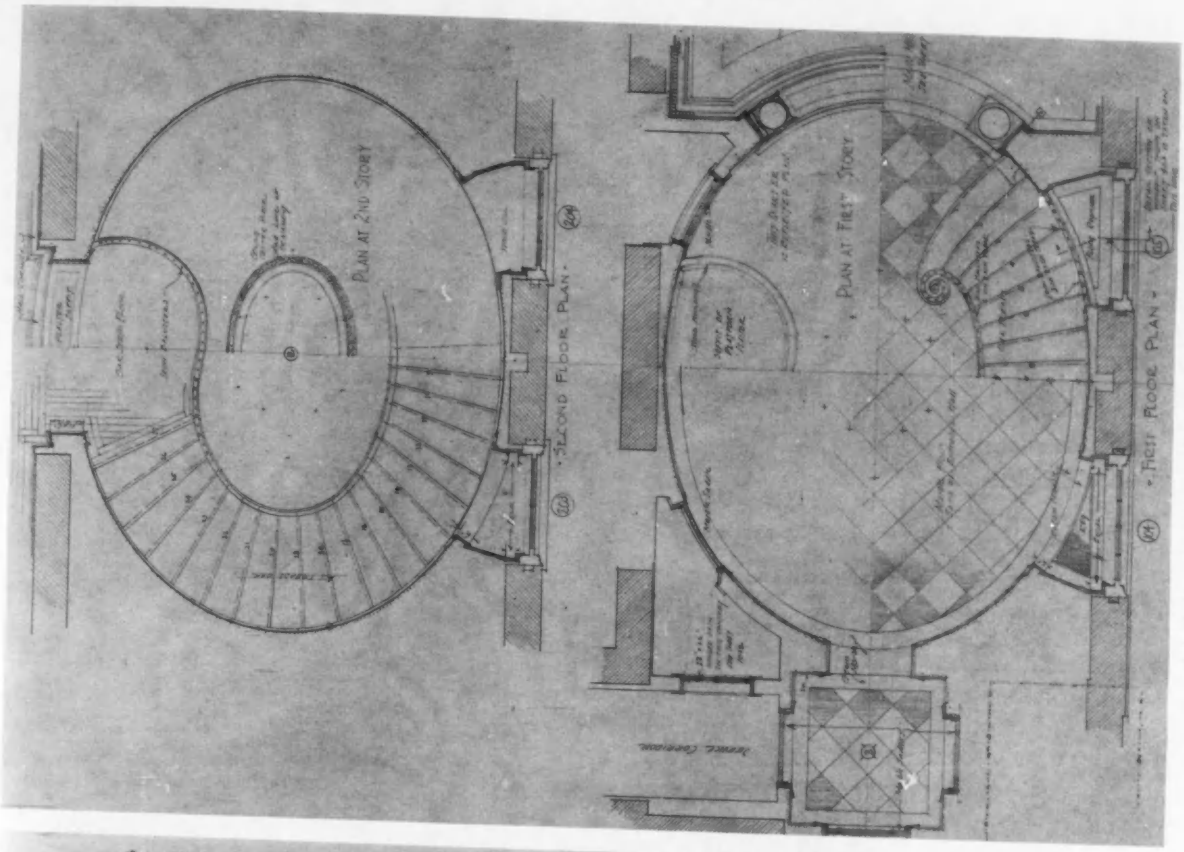
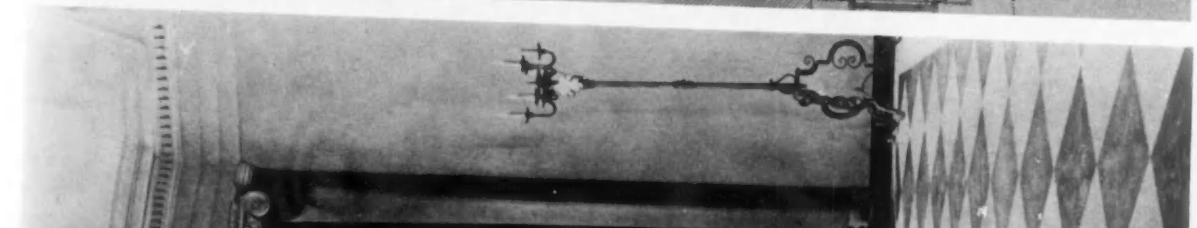


PLANS OF FIRST AND SECOND FLOOR STAIR HALLS



VIEW IN HALL LOOKING TOWARD STAIRCASE

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VIEW OF ENTRANCE FRONT

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DETAIL OF ENTRANCE PORTICO

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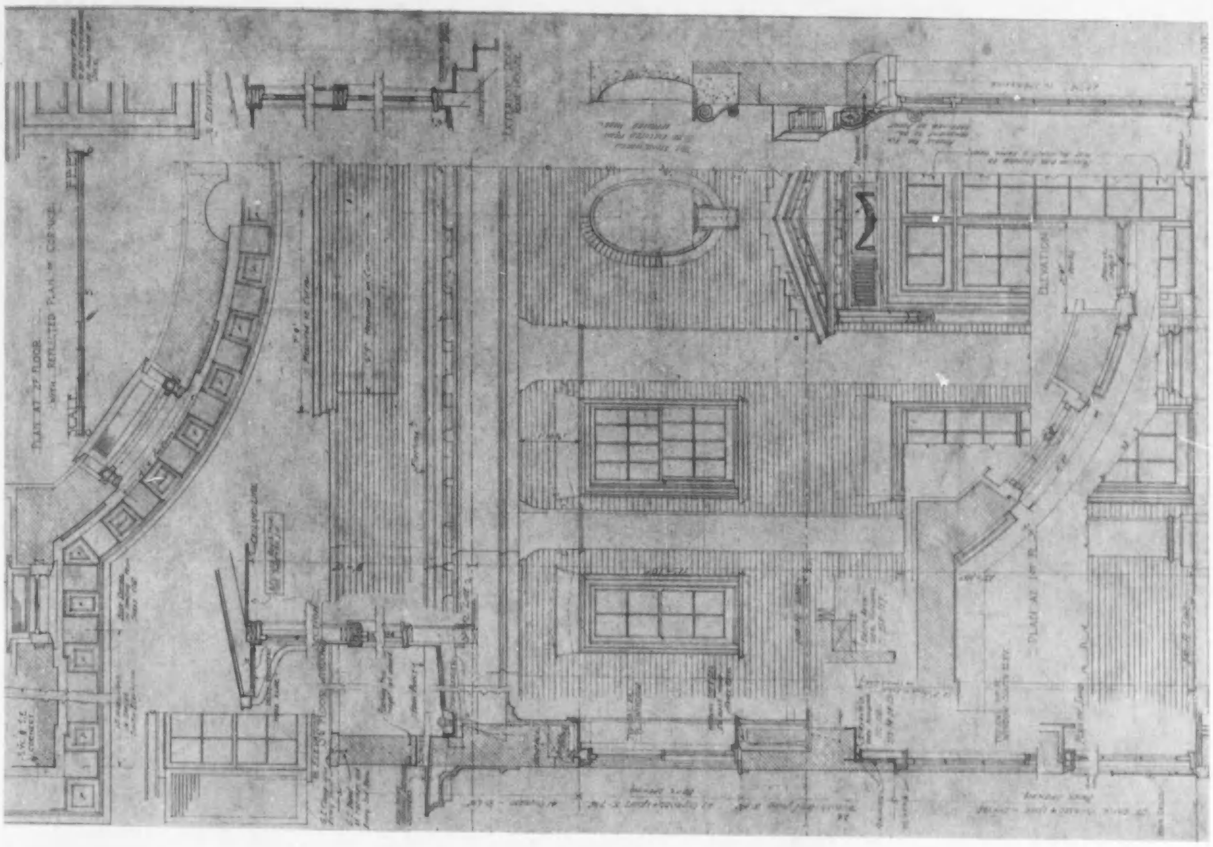
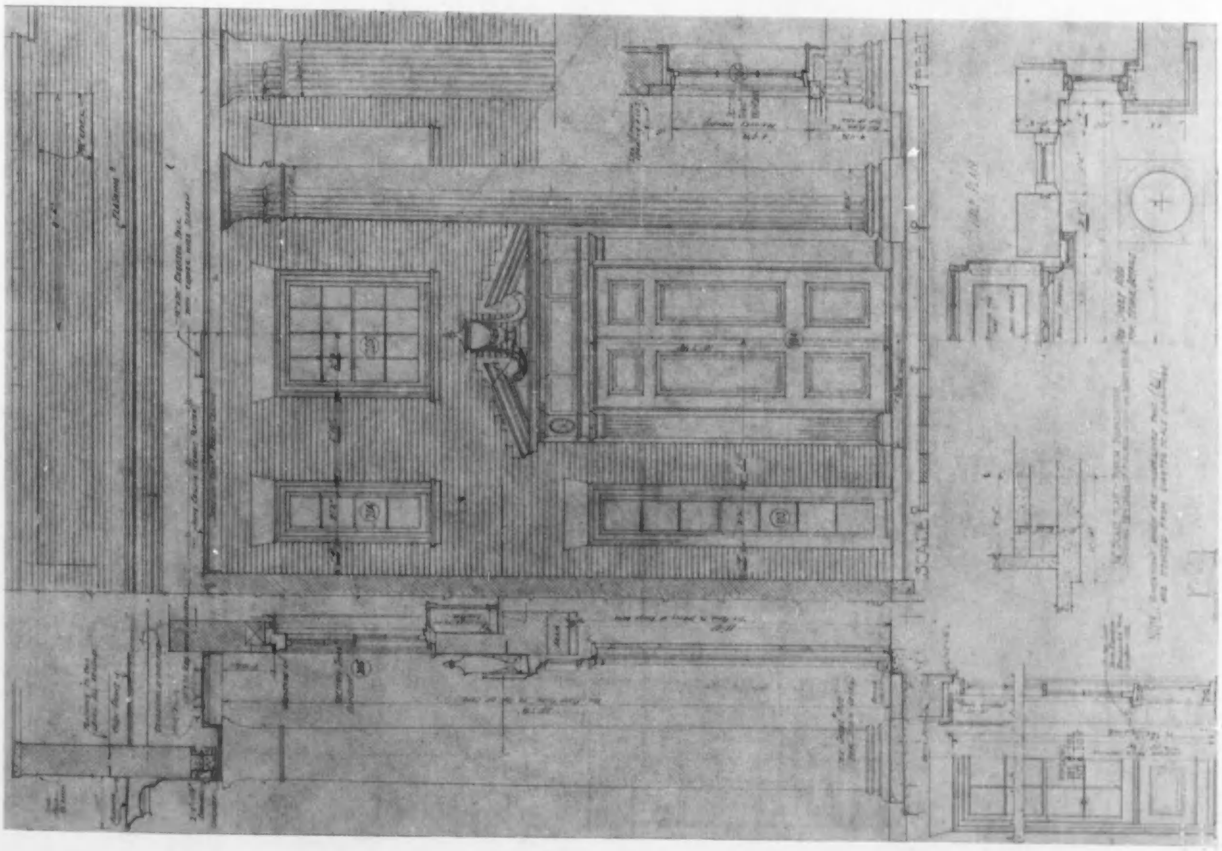


DETAIL OF BAY ON SOUTH FRONT



DETAIL OF PORTICO ON NORTH FRONT

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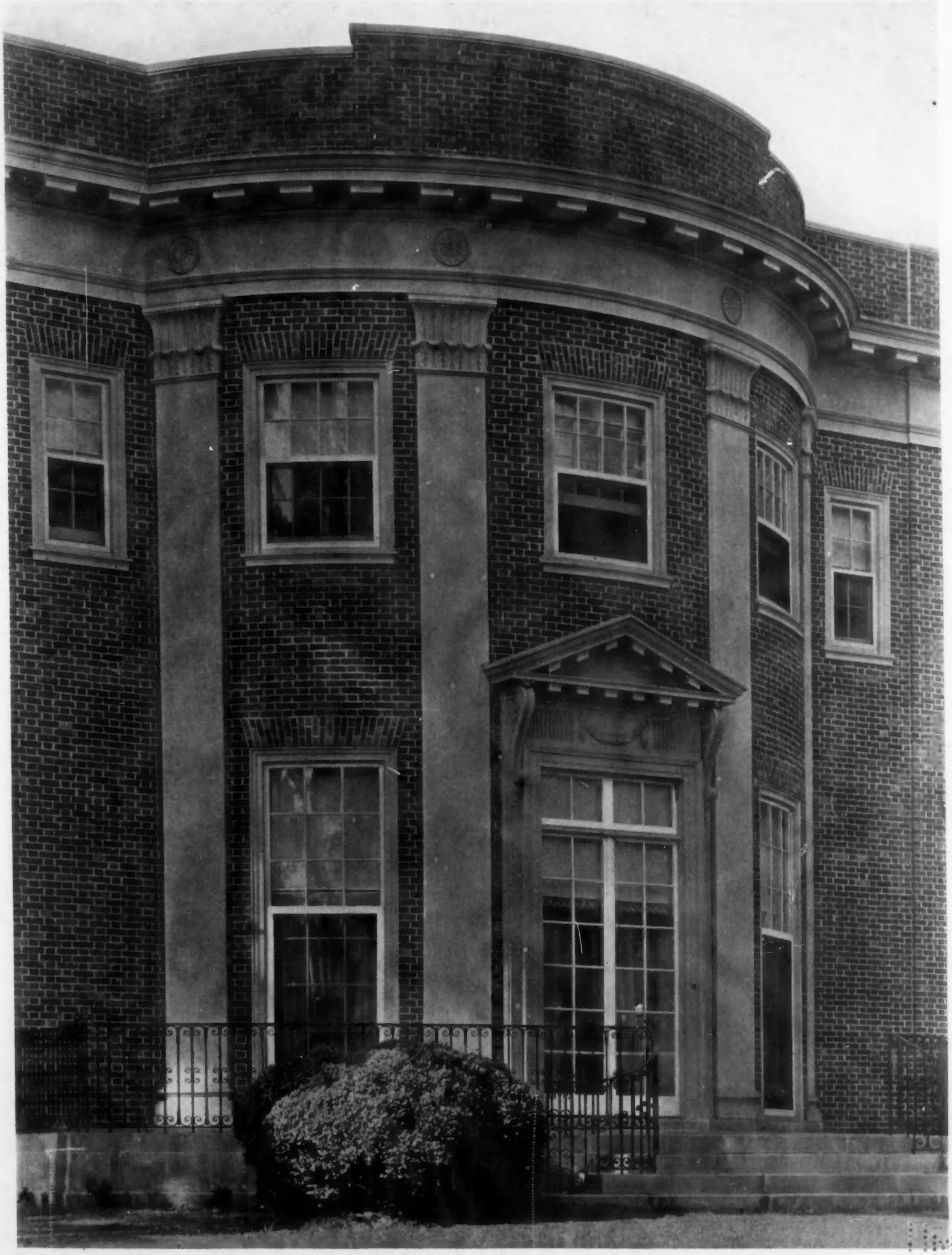
JOHN RUSSELL POPE, ARCHITECT



DETAIL OF BAY ON SOUTH OR GARDEN FRONT

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VIEW OF HALL LOOKING TOWARD STAIRWAY

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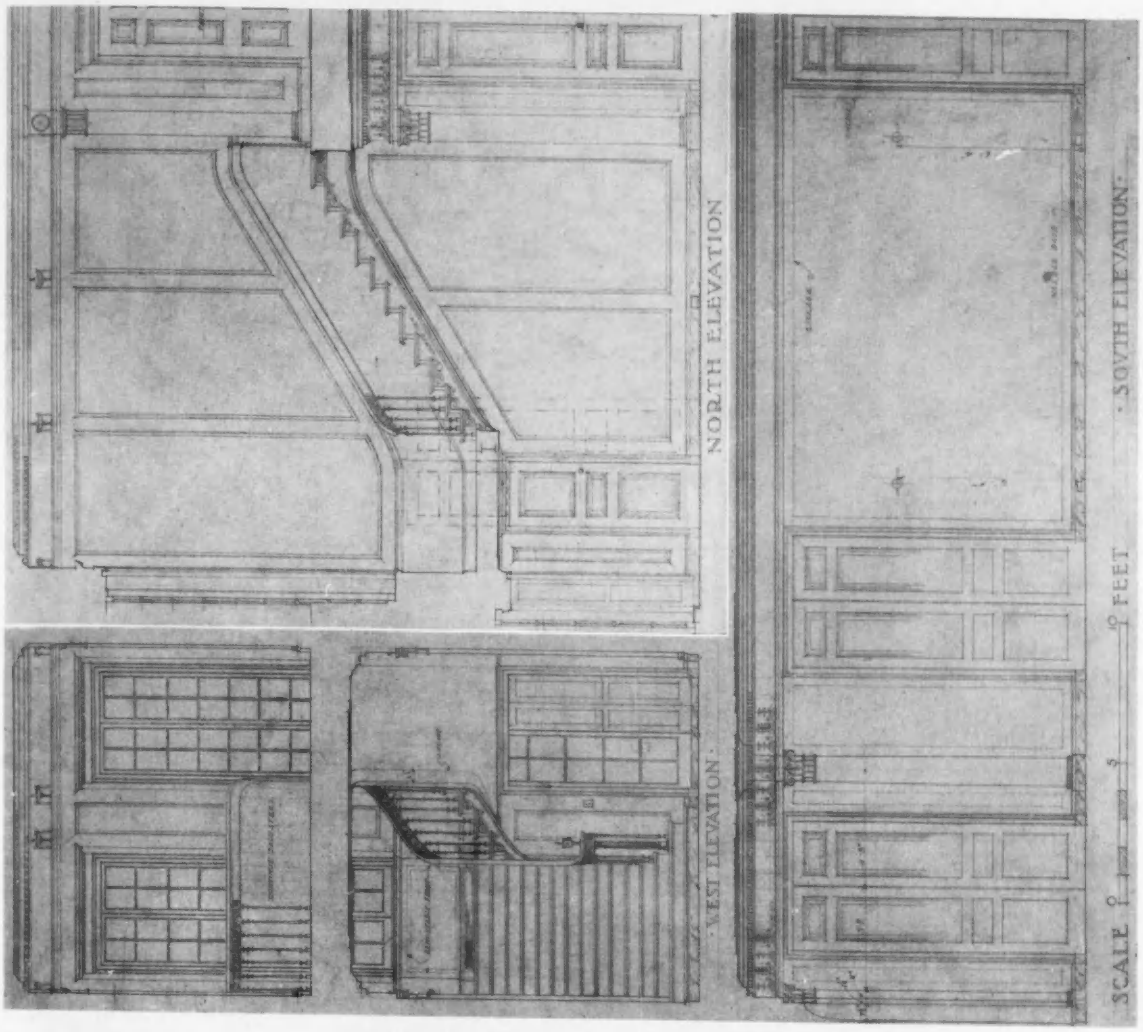
DETAIL OF HALL LOOKING TOWARD STAIRWAY



ELEVATIONS OF HALL AND STAIRS

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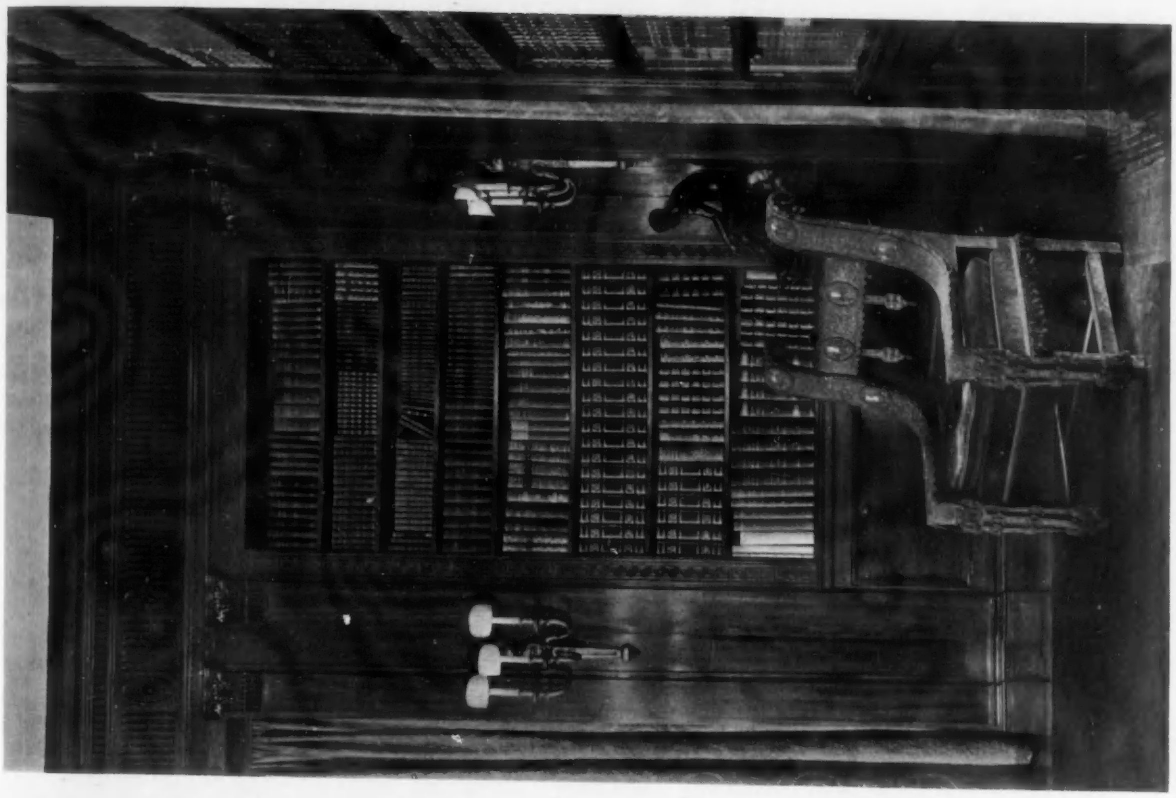
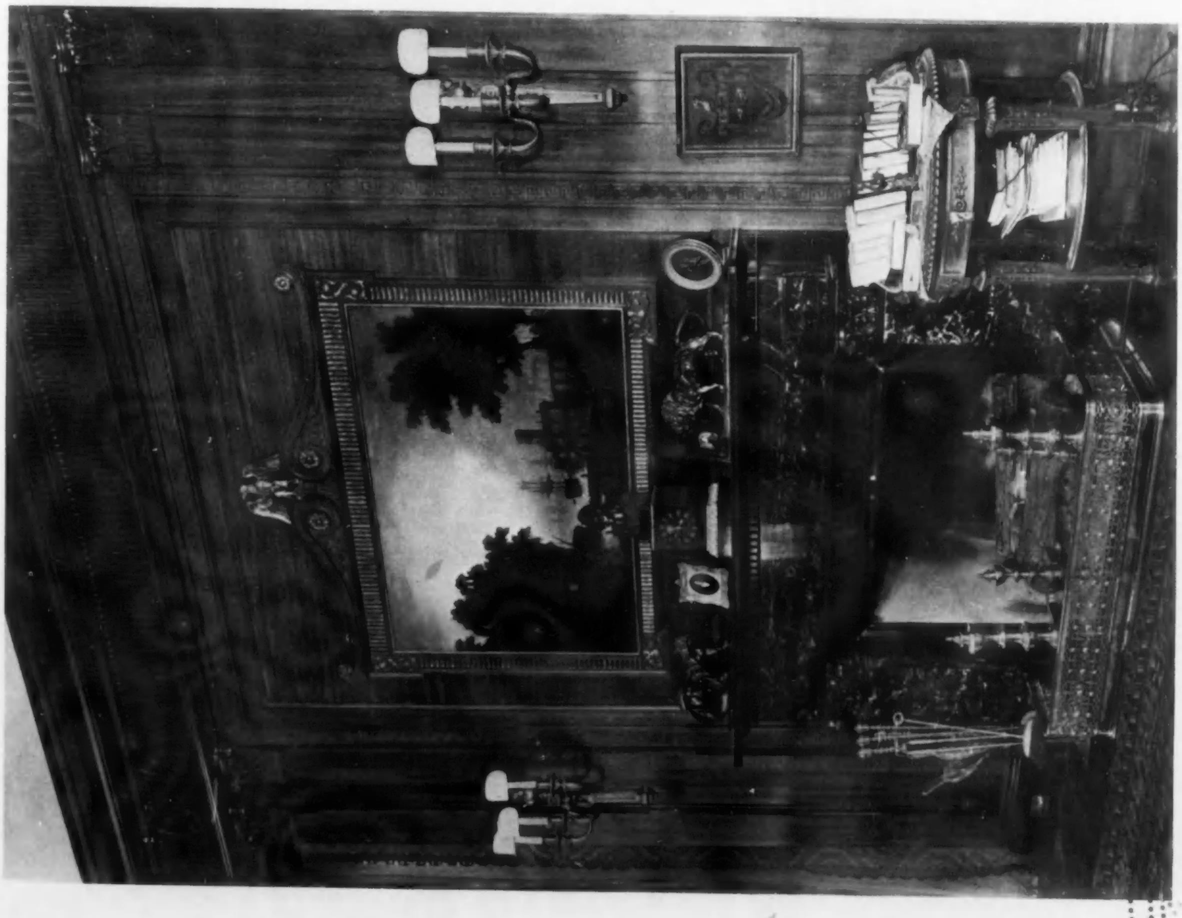


DETAIL OF BOOKCASES IN THE LIBRARY



DETAIL OF MANTEL IN THE LIBRARY

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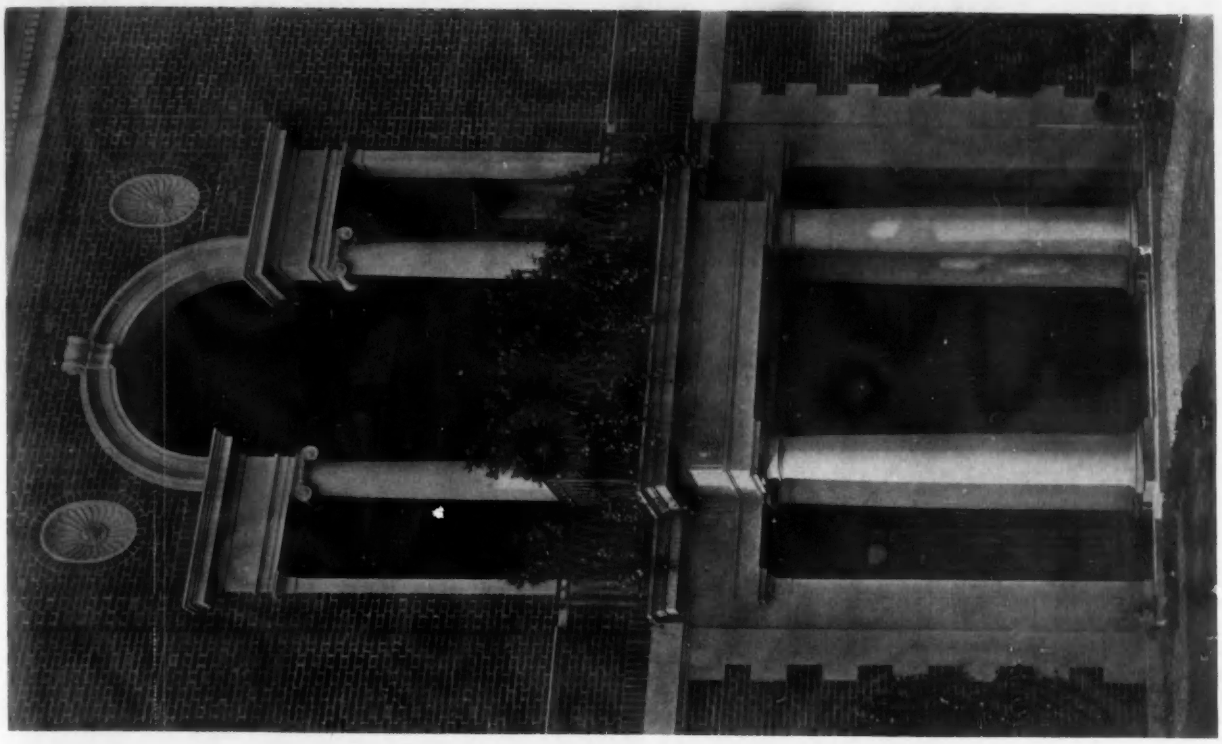
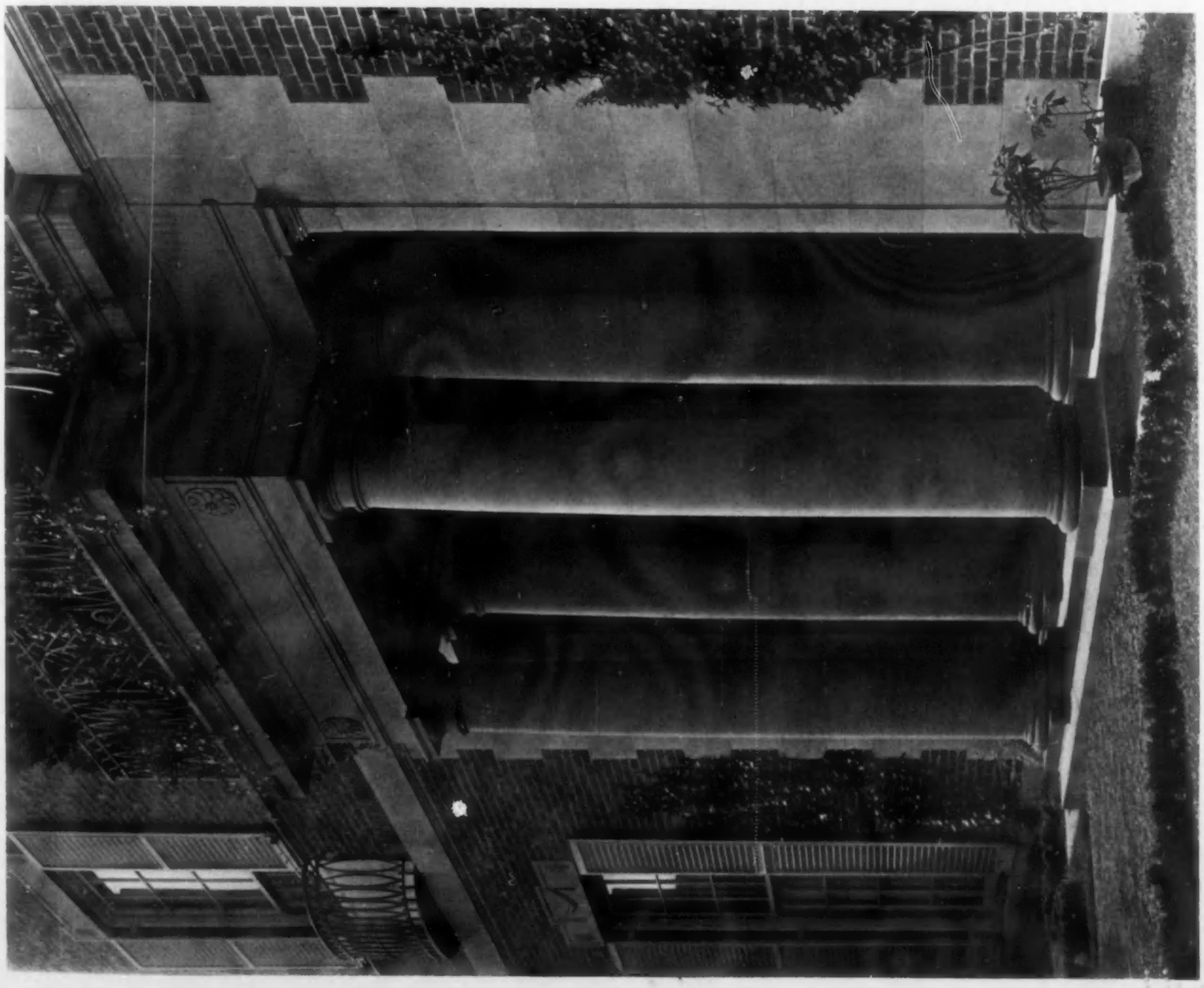
VIEW OF GARDEN FRONT

HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT



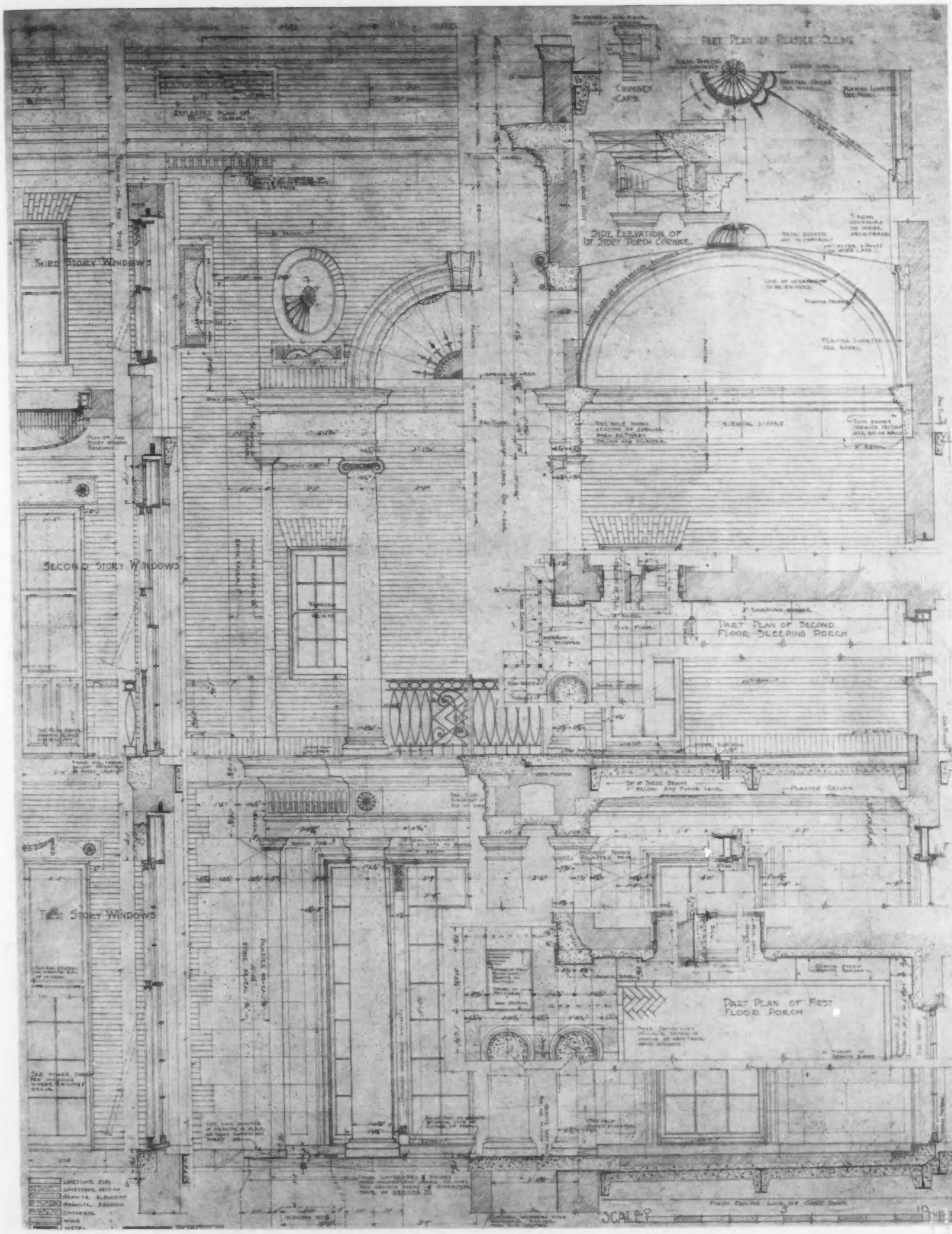
LOGGIA ON GARDEN FRONT



DETAIL OF FIRST STORY LOGGIA

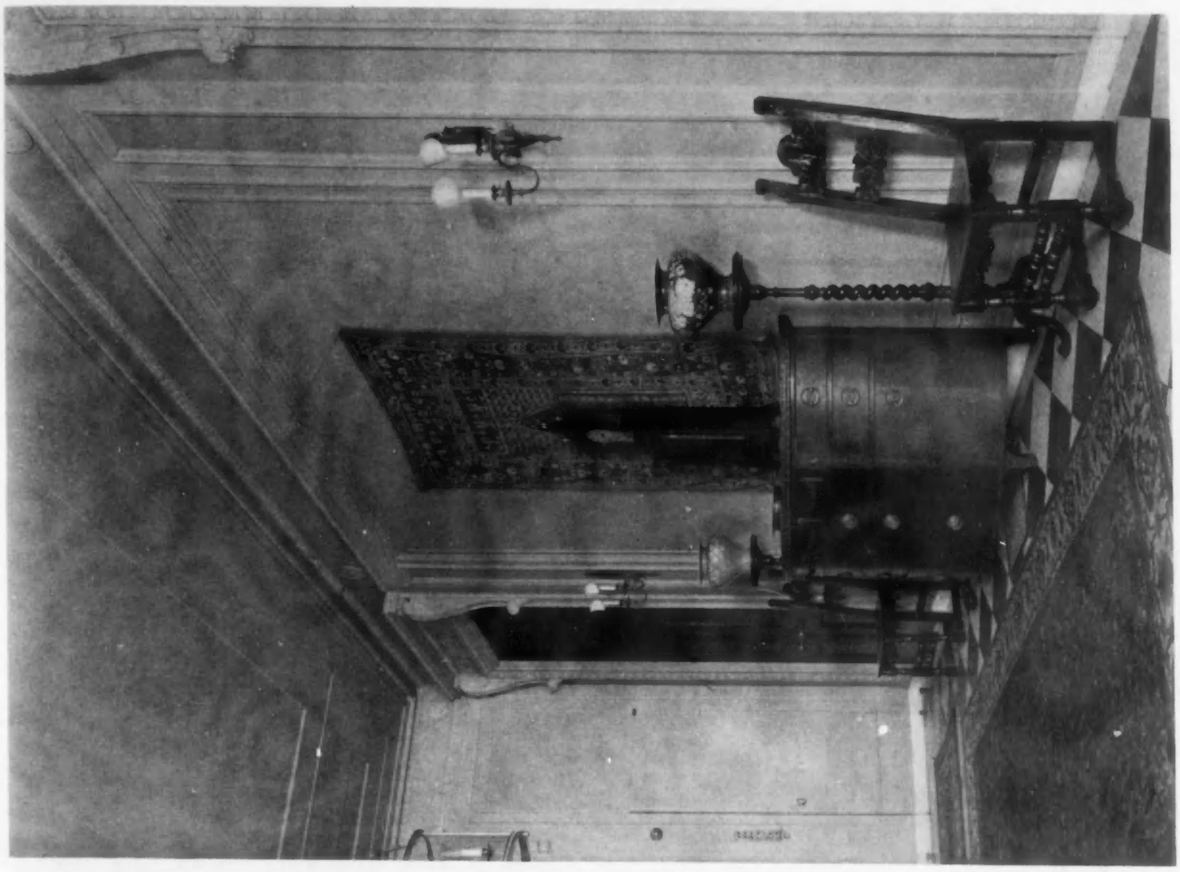
HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT



DETAILS OF THE SOUTH OR GARDEN ELEVATION

HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.
JOHN RUSSELL POPE, ARCHITECT



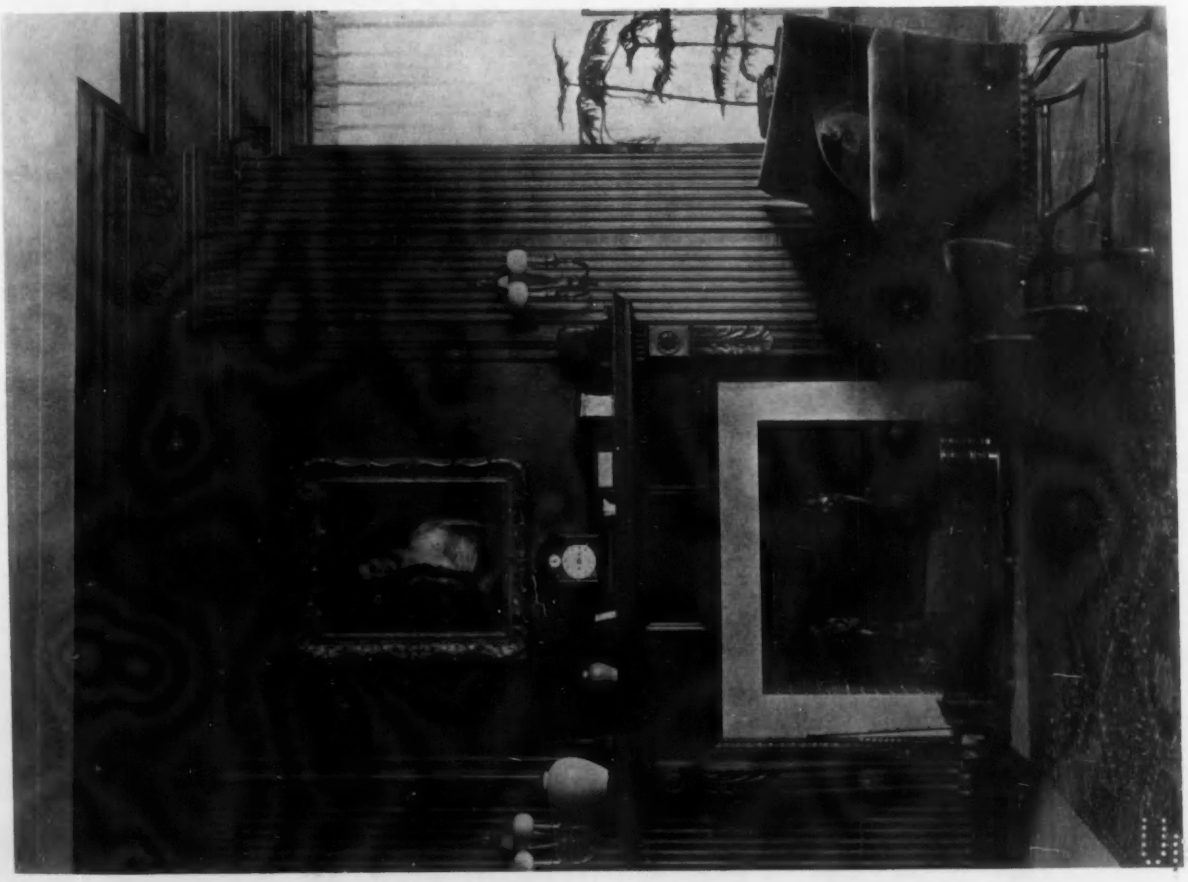
VIEW OF EAST WALL OF HALL

VIEW OF HALL AND STAIRWAY

HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT

VIEW OF DRAWING ROOM FROM LIBRARY



DETAIL OF MANTEL IN DRAWING ROOM

HOUSE OF GEORGE HEWITT MYERS, ESQ., WASHINGTON, D. C.

JOHN RUSSELL POPE, ARCHITECT

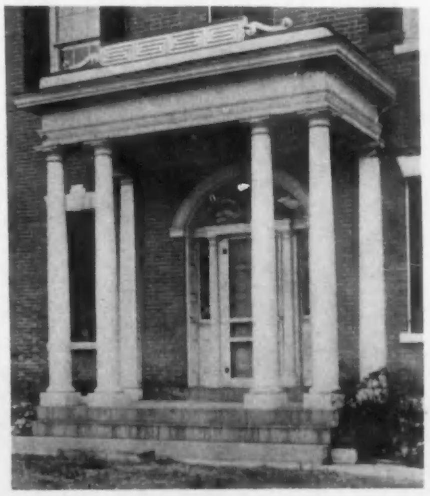
THE BRICKBVILDER COLLECTION OF
EARLY AMERICAN ARCHITECTURAL DETAILS.

PLATE TWENTY-SEVEN.

SOMEWHAT similar in plan to Mount Vernon and Woodlawn, the Colross Mansion is flanked by two wings, one for the service portion and the other for the carriage shed. It was built in 1799 by Jonathan Swift and is a good example of the country house type of Maryland and Virginia Colonial architecture.

The façade shows a large scaled treatment with good proportions and fenestration. The walls are of brick laid in Flemish bond with a well proportioned width of mortar joint. All the windows have characteristic Colonial lintels. The entrance porch is spacious and shows in its design a trace of the Greek influence. The doorway is carefully detailed and the leaded fan-light has a segmental arched top rather than the usual elliptical form.

The roof is of gray slate and is embellished by three dormers of excellent proportions and a balustraded deck. Dormers of such good proportion and appropriate setting as those still existing in Alexandria are seldom found in other localities and the ones on this house are typical of the best. The ingenious manner in which the same moulding contours were used at different scales and proportions throughout the façade is interesting. The main cornice is a most effective piece of detail, composed as it is of mouldings decorated with fine ornament and having a charming profile, all in splendid accord with the porch and dormer cornices. The frieze in the latter has been subordinated to the architrave which is supported by delicately fluted Doric pilasters.



THE COLROSS MANSION, ORONOCO STREET, ALEXANDRIA, VA.

Built in 1799.

MEASURED DRAWINGS ON FOLLOWING PAGES.

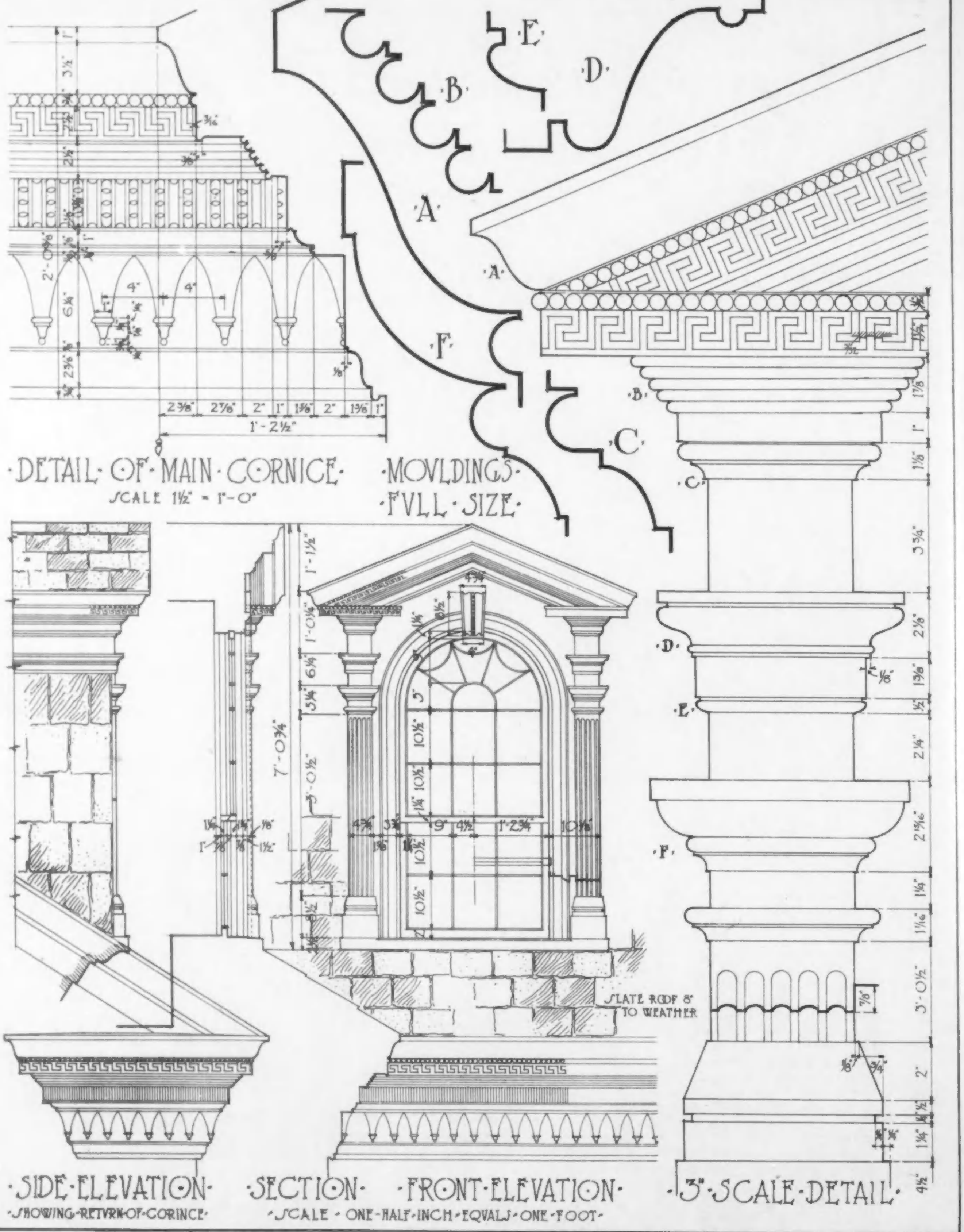


PLATE 27 AUGUST 1916	·DORMER·&·CORNICE ~ COLROSS·MANSION· ~ALEXANDRIA~VA~ ·DATE·1799· ·BVILT·BY·JONATHAN·SWIFT·	·MEASVRED·&·DRAWN·BY· ·J·L·KEISTER·~O·J· ·MVNSON·&·J·A·WEBER·

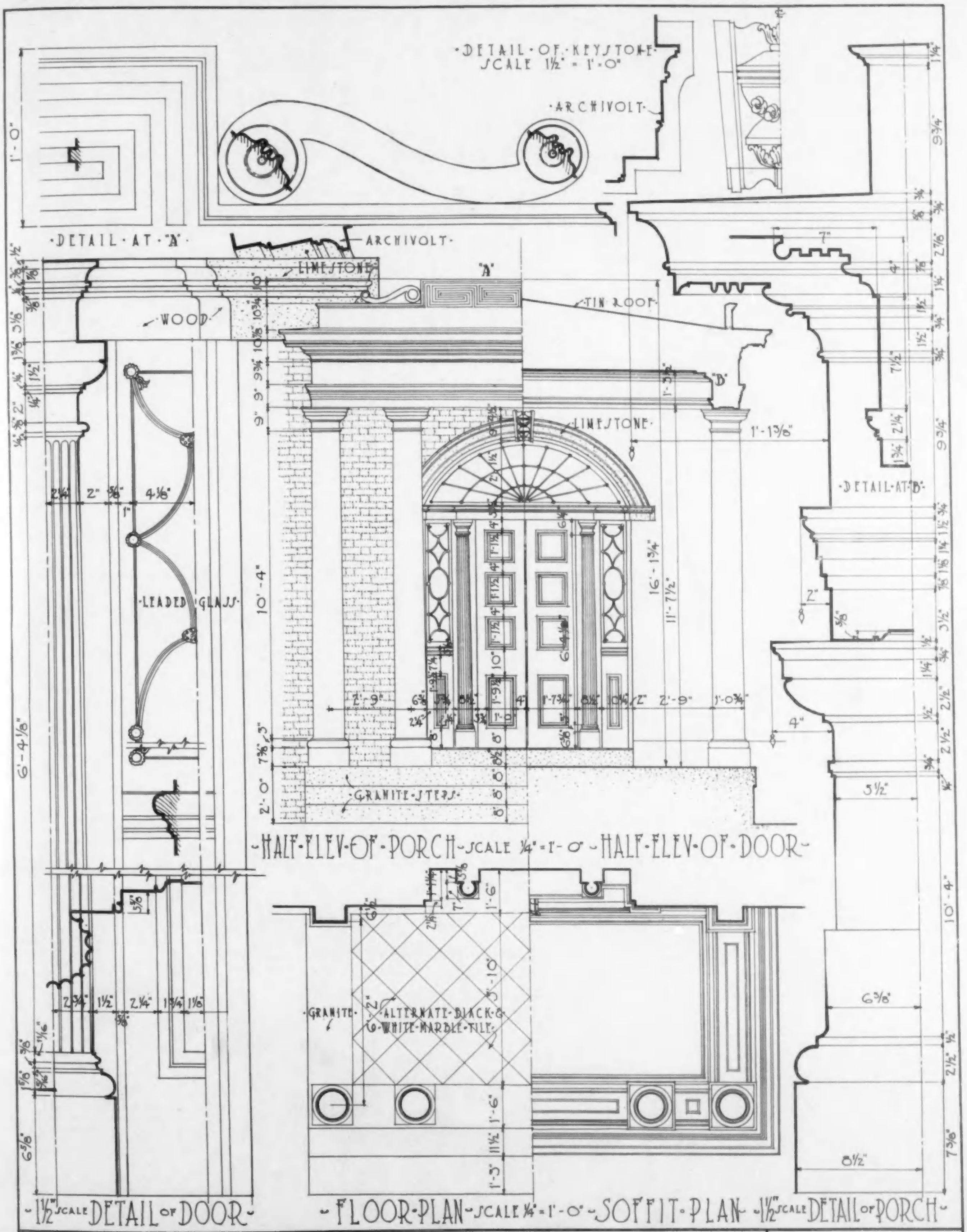


PLATE 28 AUGUST 1916	DOORWAY & PORCH - COLROSS MANSION ALEXANDRIA VA DATE 1799 - BUILT BY JONATHAN SWIFT	MEASURED & DRAWN BY J. L. KEISTER - O. J. MUNSON & J. A. WEBER

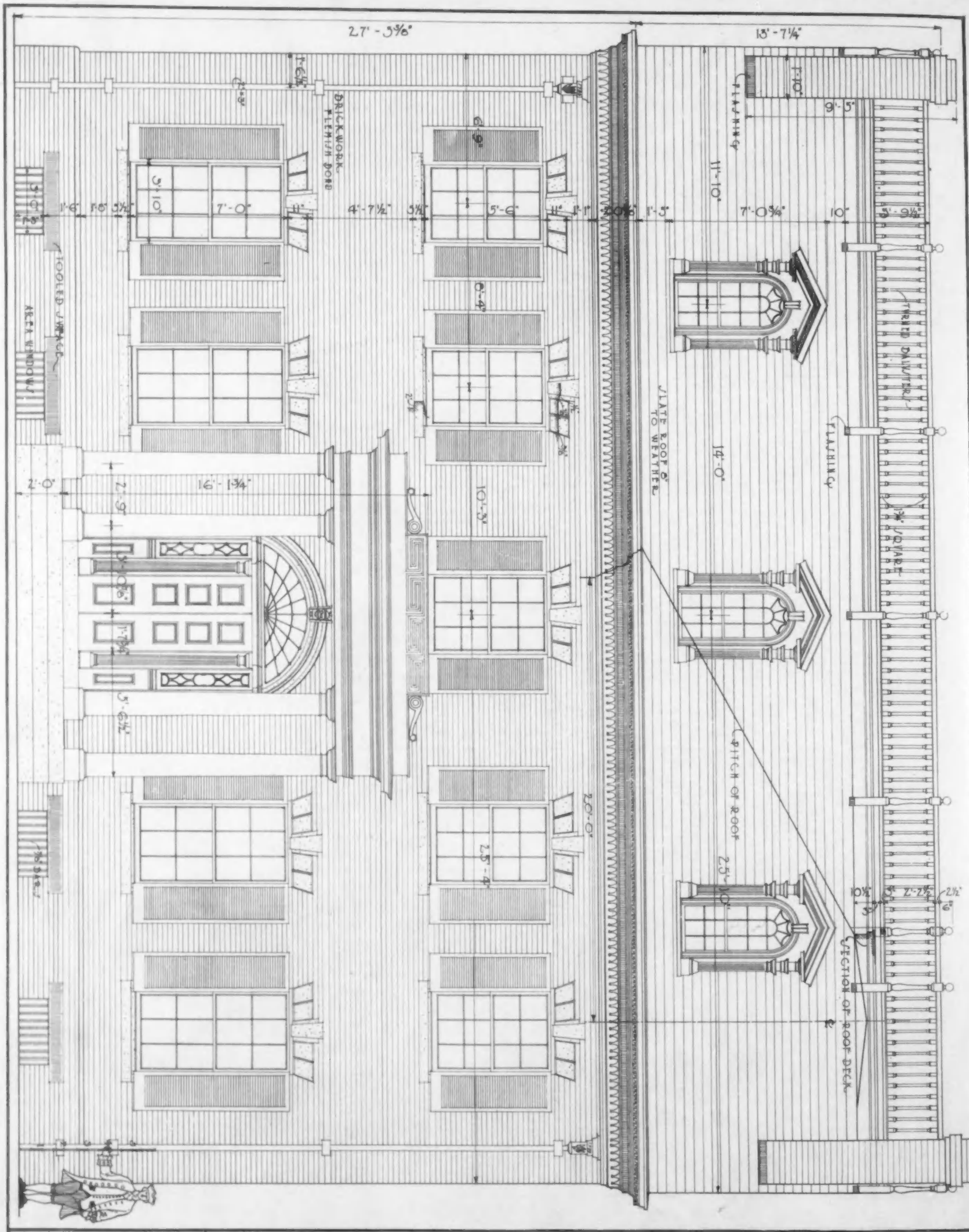


PLATE 29 AUGUST 1916	·FRONT·ELEVATION–COLROSS·MANSION· ·ALEXANDRIA·VA· ·DATE·1799· ·BUILT·BY·JONATHAN·SWIFT·	·MEASURED·&·DRAWN·BY· ·J·L·KEISTER–O·J· ·MUNSON·&·J·A·WEBER·

Dome of S. Maria del Fiore, Florence.

A STUDY OF ITS STRUCTURAL SYSTEM.

By RICHARD FRANZ BACH.

Curator, School of Architecture, Columbia University.

IN considering a work of great structural initiative, standing on the threshold of an epoch in art, such as Brunelleschi's dome in Florence, we are confronted with two insistent questions, each leading to an inviting avenue of study: what are its historical precedents? and what is the type of construction involved? In the case of the present example we can answer both by recording briefly the structural history of the dome, referring to precedents in parallel and relying upon available contemporary accounts for explanation, as the structure rises to completion course on course.

The story of this dome is written in a number of slowly moving and loosely woven chapters, each headed by a master's name. These it does not behoove us to recount within the narrow compass of these pages.* Suffice it to say that when the work of one of these masters, Lapo Ghini, threatened to fall in 1367, his design was revised by a committee of eight artists, including Orcagna and Taddeo Gaddi. In a time of recognized versatility we are not surprised to find painters on such a board of investigation. The result of their deliberations was a model, supposedly obviating all defects thus far discovered. This showed a nave of four square bays flanked by narrow aisles with shallow oblong bays of corresponding length. The measurement from pier to pier was to be 60 feet, and the nave height 135 feet — a good indication of the Italian liking for breadth and squareness. The total interior length of the model was about 480 feet, and the octagon proper at the crossing achieved a diameter of slightly under 140 feet, while the total width of what might be called the crossing, that is, the space between the lateral apses, approximated 300 feet.

The system of support adopted for the dome, which may be considered our authoritative guide until the advent of Brunelleschi himself, recognizes the value of the original scheme of Arnolfo di Cambio, the first designer and sterling master of the thirteenth century, dated 1296, and providing for eight surfaces or severeys — no details as yet appearing, however, as to the essential structural system of the dome proper — resting upon four gigantic piers bound together by four great cross arches. One of these arches leads to the nave, and passages are built into the two piers which it spans to permit a continuous line of sight along the aisles into the open crossing. The other three arches open into polygonal, sc. four-sided, apses or tribunes, which by their covering half-domes furnish powerful abutment. These and other features to be mentioned, with the exception of the dome itself, were executed according to this model of the committee of eight, and this description of the model is to that extent, therefore, practically that of the completed building. The piers receive the direct vertical load of the dome, but must also be counted upon to resist the thrust of the great arches as aggravated by their own effort in the actual support of the dome, which effort they in turn convert into thrust. Therefore the piers are necessarily of enormous perimeter and solidity, and other masonry features are of corresponding mass. Five chapels are built into the thickness of the walls of each great apse and a sacristy into each of the eastern piers. To be doubly assured of safety the piers are further strengthened diagonally, with reference to the square formed by their bases in plan, by means of four smaller polygonal projections of masonry, whose crowns rise to the height of the apses, *i.e.*, to the upper line of the nave clerestory. It should also be noted that the exterior effect of the main apses is quite that of chapels with ambulatories; the open space of each rises in a separate clerestory, pierced by coupled windows, and supporting a half-dome, the five chapels

Dome of S. Maria del Fiore, Florence

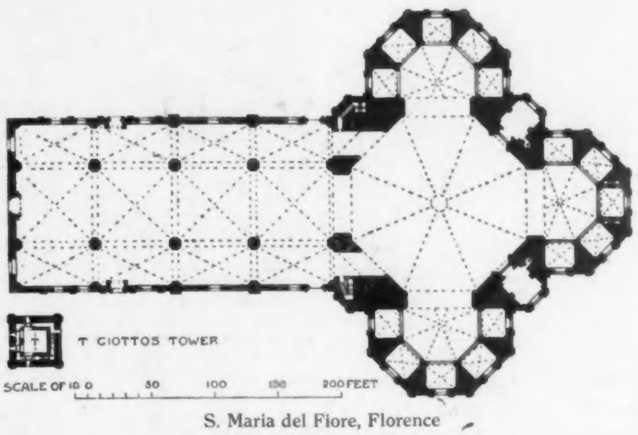
Exterior showing tribunes and other buttressing masses; also unfinished gallery by d'Agnolo at base of dome

* See bibliographic note.

S. MARIA DEL FIORE, FLORENCE
Elevation of dome and substructure. (From Sgrilli)

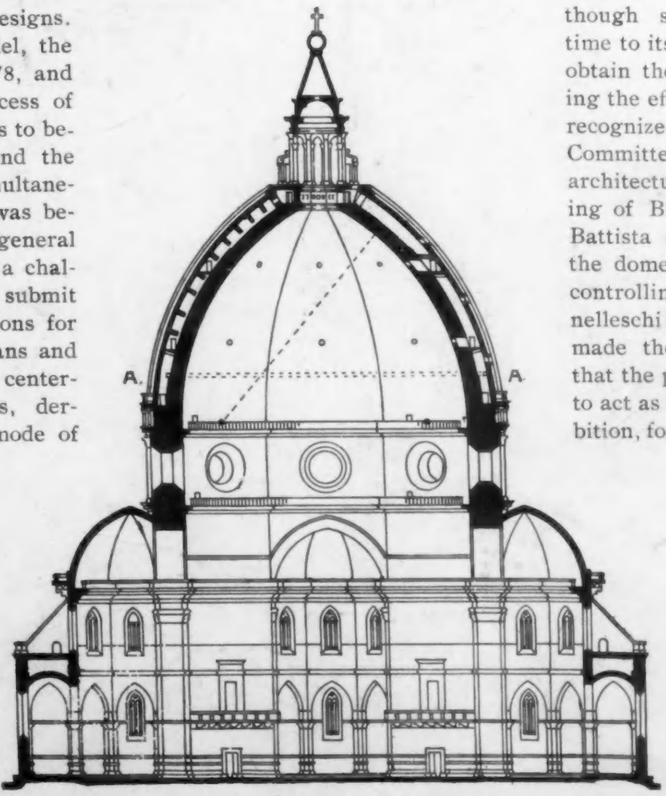
projecting from this space rising only to about half this height and separated by solid buttresses frankly expressed as wall masses.

Although a multitude of minor stipulations were made at various times and the dome itself was made the subject of a separate competition, with reference to its own construction, it would seem that this model of 1367 furnished so definite a line of direction for subsequent architects that their problems became increasingly those of execution solely. It would also seem feasible to assume that the original plan of Arnolfo, although altered in size, still retained its vitality, and that the complete east end plan was organically final as determined by the model of 1367. At any rate, an eight-sided dome, or, more properly, an octagonal cloistered vault for the crossing, had been projected from the outset and would seem to have formed part of every acceptable suggestion for the entire building in numerous competitions covering many years. Unfortunately authoritative information on this and other points is not available, since the design models, the only safe guides, were regularly destroyed by order when superseded by better favored designs. As based on the new model, the nave was completed by 1378, and two years later a great access of energy drove the Florentines to begin the four giant piers and the three branching apses simultaneously. By 1410 the drum was begun and, finally, in 1418, a general competition was published, a challenge to all and sundry to submit models, drawings, suggestions for the dome construction, means and machinery for its erection, centering, scaffolding, windlasses, derricks, materials, and the mode of their use.



S. Maria del Fiore, Florence
Plan. (From Simpson)

Lorenzo Ghiberti, already known to us as a versatile artist, submitted a number of models, one of them of brick, in the making of which he had employed four masons. Brunelleschi submitted, according to varying reports, either two or three models, in one of which, probably the second in point of time, he counted upon the help of Nanni di Banco and Donatello. His first model was his own; the third is hedged about with such doubt that it may here be ignored. The exact relation between the first and second it is difficult to establish; latest researches seem to indicate that the first was approved while still unfinished and was considered of such value that he was commissioned to undertake the second with the assistance of the two collaborators, who had in the meantime demonstrated their ability along the line of Brunelleschi's efforts. This was, of course, in accord with the usual practice in connection with the cathedral fabric, which denied the best artists the sole control and sought to achieve quality in cumulative fashion only. At any rate, this revised model was made of brick and was built *senza armadura*, without centering. Later, we find Ghiberti's name in conjunction with that of Brunelleschi in the instructions for the preparation of still another model. This was of wood, and the general opinion is that the two masters worked together in its production. As was the custom, all Florentines were invited to contribute to a general criticism of the work. Finally, as though submitting for the last time to its bugbear of attempting to obtain the best results by combining the efforts of good men without recognized headship, the governing Committee of Four appointed an architectural triumvirate, consisting of Brunelleschi, Ghiberti, and Battista d'Antonio as builders of the dome. It would seem that the controlling hand was that of Brunelleschi — he having jealously made the problem his own — and that the presence of the others was to act as a drag-anchor on his ambition, for his plans were not at any time granted more than reluctant sanction in the popular mind, despite their formal acceptance. It has been maintained that Brunelleschi was largely responsible for the last general competition, and some have ventured the *innuendo* that he was so certain of his own success that he persuaded the committee to institute the broadcast competition simply to



S. Maria del Fiore, Florence
Transverse section at transept showing giant piers, disposition of tribunes, relative thickness of concentric shells of dome. (From Simpson)

provide a large number of designs that might act as foil and background to the quality of his own. That his scheme of building was a daring one is seen in his own statement that he intended to do the work without centering. This is not to be construed literally, however, for we have an old drawing which purports to be a faithful representation of the centering and scaffolding used in the upper part of the dome.

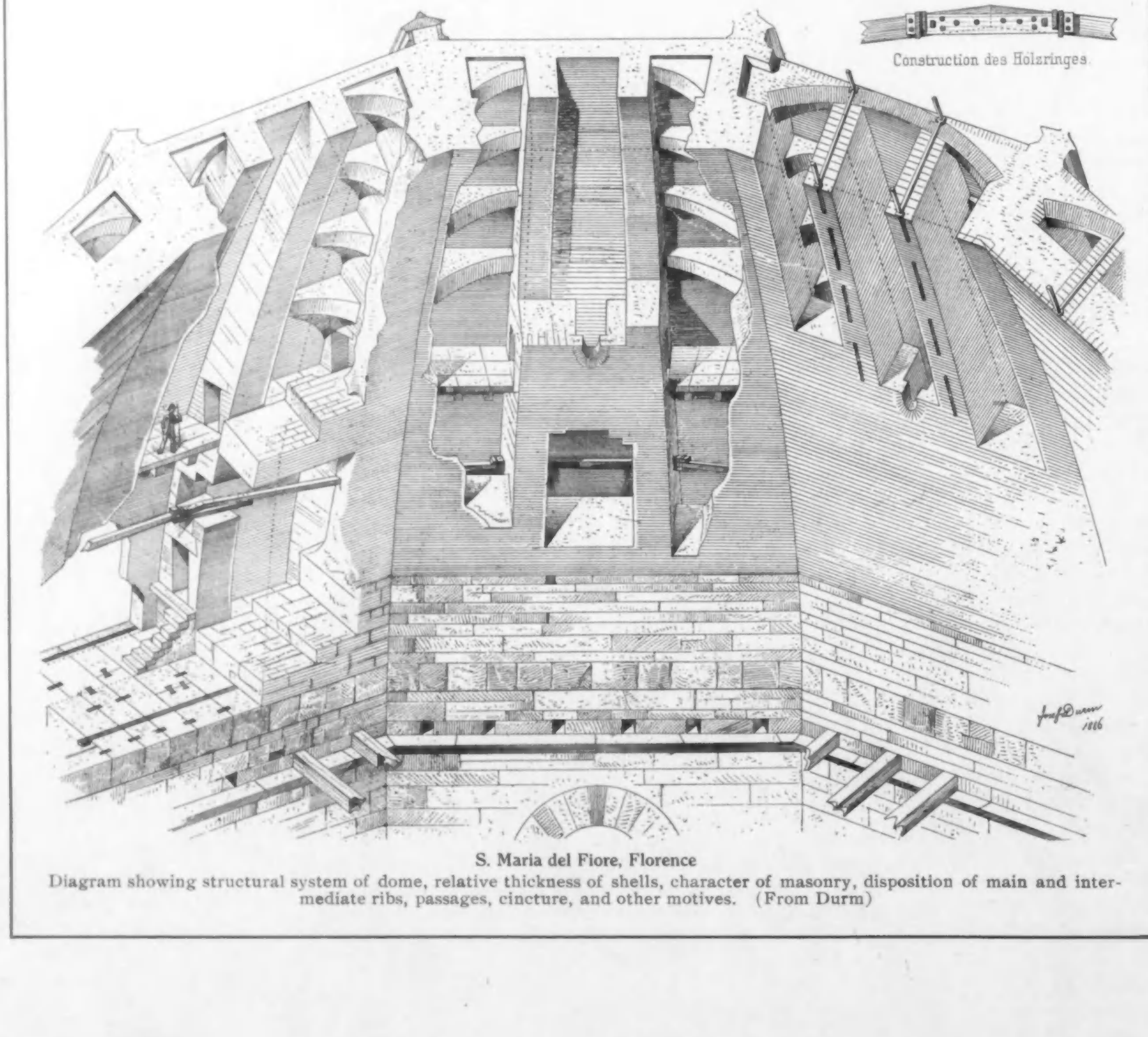
Brunelleschi had not counted upon Ghiberti as a mentor. The latter's activity in regard to the dome had at all points concerned design and suggestion, but never practical construction. Both architects had their supporters; intrigue developed; finally Brunelleschi even spent a short time in jail. His ability was bound to have its effect in the end, and, knowing this and fully assured of Ghiberti's vulnerable spot, he rid himself of his estimable compeer by a ruse, feigning illness, which promptly stopped all building. Battista d'Antonio cut so small a figure that his activity soon became merely nominal.

Whatever these difficulties may have been, the joint model of Brunelleschi and Ghiberti for the dome proper was definitively accepted and in 1420 a program of construction or table of specifications for the finished work was drawn up. A discussion of these specifications will, with certain restrictions, provide an analysis of the construction of the actual dome.

II.

The Florentine dome is the first example in Christian architecture in which the full sweep of contour * is frankly expressed and effective from spring to crown. This is due chiefly to the particular type of internal construction which made possible the elimination of counterweights, or members rising to a given height on its exterior and serving as a kind of completely circular anchor buttress, as is the case in the Roman Pantheon and, in different fashion, in Byzantine drum and dome systems which were largely developed out of similar principles. No doubt this advantage had formed part of the conception of many an earlier designer, possibly even of Arnolfo's.

* The question of the contour is considered throughout as the one point from which no deviation was permitted. We find in the specifications the words: *la cupola ha misura di quinto acuto*, a clause signifying that the line of contour is set down as the arc whose radius is four-fifths of the diameter of the dome, *i.e.*, from corner to corner of its octagonal base. What is more, to refer to syntax purely, it is noteworthy that the indicative mode, *has*, appears in this statement, while in all other parts of the program involving new work the usual subjunctive form, *should*, appears. From this it would seem that the contour of the dome was in general a matter of settled history before Brunelleschi's time, and that at least to this extent the founder of the Renaissance in architecture figures more prominently as constructor than as architect proper.

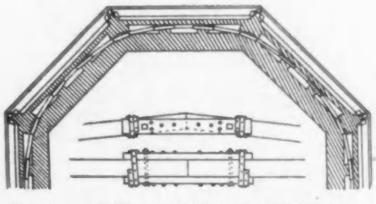


S. Maria del Fiore, Florence
Diagram showing structural system of dome, relative thickness of shells, character of masonry, disposition of main and intermediate ribs, passages, cincture, and other motives. (From Durm)

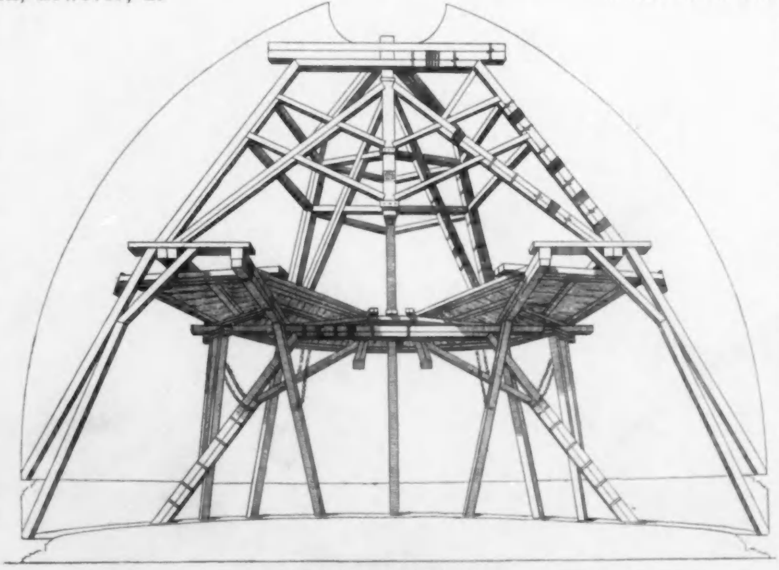
What is more, the work of the dome building had been carried up a short distance — its verticality of contour having made this possible — when the specifications of 1420 were approved, and a decided indication of its prospective silhouette had therefore been at hand for some time. It becomes, then, a problem of completing work already under way, although this aspect of the task does not by any means reduce the structural obstacles to be encountered. We should not, in view of these circumstances, hesitate to give proper credit for unusual farsightedness to the audacious fourteenth century masters — whose conception the dome as we have it really was, and who ingenuously looked upon their task as one quite within the possibility of their own achievement.

Baptistery of Florence

The specifications called for a dome of two shells, with void between. The question at once arises: had this form of construction any definite prototypes, and what were its precedents? While suggestive examples existed in a number of places, Florence itself included, the structural system of this dome is not in any sense a duplication of any building then existing. Antiquity knew no such system, although it has been suggested that Brunelleschi derived his inspiration possibly from Roman skeleton rib vaults with horizontal bond courses, or more particularly from the Baths of Gallienus, which show a dome of semicircular section, supported on a decagonal substructure with ten brick ribs rising from the angles and striking against the rim of an oculus above, and twenty intermediate ribs which, however, as though to spoil the suggestion, do not rise the full distance to this rim. The prominent example of the Pantheon itself could offer but little in the way of structural study, since its structural system was not then even partially understood. In effect, however, its inspiration must have played a considerable rôle in Brunelleschi's ambition in Florence, due to his study of ancient architecture in conjunction with Donatello, although the desire of Florence was for greater height and for pronounced exterior effect. In similar fashion the lesson of Hagia Sophia, which he had not seen, could be of slight assistance. There were good Byzantine examples in Italy at no great distance from Florence — buildings using domes on drums but carrying the latter up to a point on the haunch and partly concealing the dome curve. There were also good medieval examples at Aachen, which is covered with a sloping roof, and at Pisa, which is elliptical in plan and of high section. A number of Italian baptisteries might have offered more than impartial suggestion: Florence, Parma, Cremona, for example. Of these the one at Florence, with which that at Cremona is practically identical in construction, is perhaps most interesting in this discussion. This twelfth century building is eight-sided and surmounted by a pointed brick dome, springing from within the drum, with eight heavy angle ribs and sixteen lighter intermediate ribs, two on each side, numerically at least the exact equivalent of those in the duomo. The objection to this as a final model for Brunelleschi was that on each of its faces rise three barrel vaults whose height diminishes with the rising contour of the inner dome until they die against its crown, *i.e.*, until their outer uniform plane becomes tangent to the curve of the dome; these vaults are covered by a low conical pen roof. This arrangement eliminated all exterior expression for the actual curve of the vault, and the Florentine mind had too long visualized a bold dome motive on the cathedral as the hub of the city of the arts. Finally there was Arnolfo's dome as pictured in a fresco in the Spanish Chapel in S. Maria Novella, which shows a dome of bolder contour, — possibly a painter's modification, — but indicates the same general exterior treatment of the finished work. This was considered the actual conception of Arnolfo as conveyed to his successors, by them held inviolable, and quite probably incorporated in the



Cincture of Chestnut Beams and Mode of Making Joint
See A in section. (From Simpson)



Brunelleschi's Scaffolding
(From Nelli)

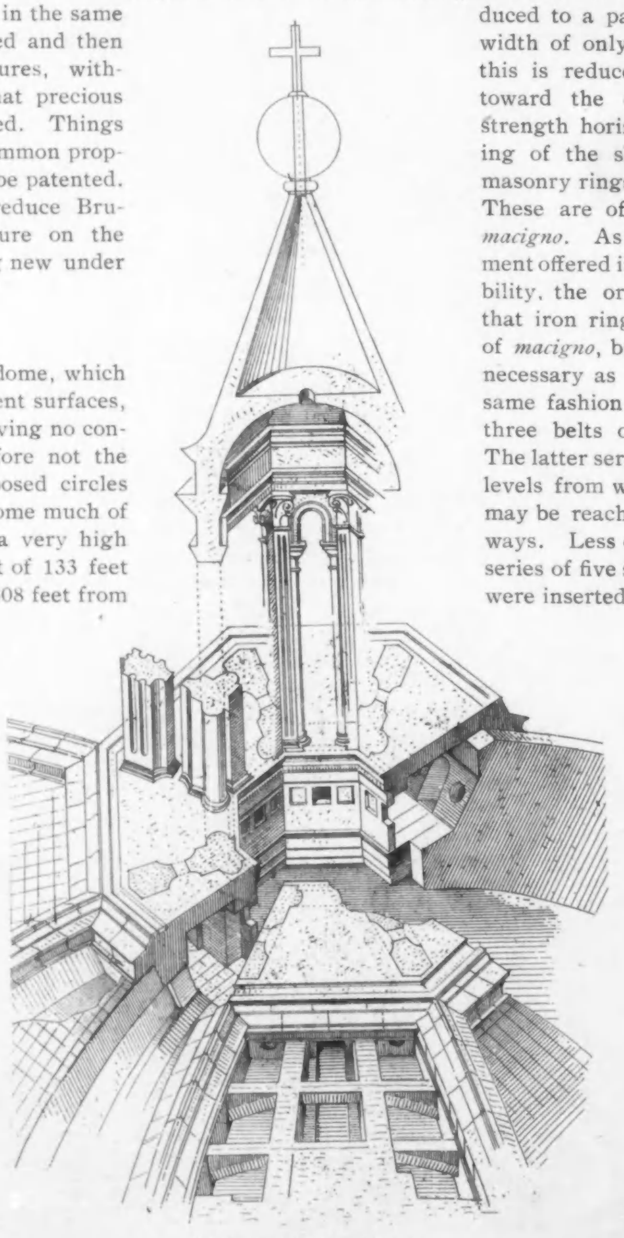
design of the eight artists of the fourteenth century — Orcagna undoubtedly the leading spirit among them — whose ability has never been given due credit in this connection.

The construction of the dome, then, is supposedly inspired — quite obviously so, to a number of critics — from the Baptistery of San Giovanni in the same city, the effect being that of the whole baptistery dome construction elevated upon a drum. It would seem, however, that Brunelleschi's modifications were of such importance — if modifications they are conceded to be — and the magnitude of his problem imposed such aggravated difficulties that he should be entitled to repute beyond that of the copyist. He was distinctly an adapter — great architects are always so classified — and he used the examples, forms and means at his disposal as the legitimate point of departure, in the same sense that the Roman adopted and then adapted certain Greek features, without loss of originality — if that precious quality be properly construed. Things already in general use are common property and cannot, so to speak, be patented. It is bootless to attempt to reduce Brunelleschi's architectural stature on the premise that there is nothing new under the sun.

III.

In actual construction the dome, which consists of eight interdependent surfaces, is of the cloistered type, involving no continuity of surface and therefore not the suggested series of superimposed circles which give to the uniform dome much of its strength. It is built to a very high section, and achieves a height of 133 feet from its springing, or about 308 feet from the pavement, with a maximum diameter of 138½ feet. The drum, which forms its immediate support, measures 40 feet in height; its walls are 16 feet thick and each of its faces is pierced with a circular window similar to those of the nave clerestory. For nearly half its height the dome is built of carefully selected stones clamped and doweled together; the remainder is of brick. The two shells exist separately above a point about 16 feet beyond its spring, or nearly 8½ feet above the point where its curvature begins. The inner shell is, obviously, the heavier, measuring 7 feet in thickness, and is built in three stages, their thickness decreasing slightly upward. The thickness of the outer shell is practically uniform, varying only about 7 or 8 inches between base and crown. The void between the shells, which measures from 4 to 5 feet on the radius of the dome, is used for the disposition of stairways and passages.

As for the construction in detail, we find again in consulting the specifications that the dome was to rely upon eight major and sixteen minor ribs, the latter spaced evenly two upon each side and all rising the full height from drum to oculus above which the lantern appears, and all of the full thickness of both shells plus the space between them. Both sets of ribs decrease slightly as they rise, both in width and in thickness or depth. By this means of construction each dome face, measuring at its widest point about 53 feet, is in its free surface reduced to a passive area of an aggregate width of only about 13½ feet, and even this is reduced still further as it rises toward the crown. To gain further strength horizontally and for the fastening of the shells to one another, three masonry rings were built into the fabric. These are of a type of slate known as *macigno*. As though even this arrangement offered insufficient assurance of durability, the original specifications require that iron rings be inserted around those of *macigno*, but these were not considered necessary as the work went on. In the same fashion six instead of the executed three belts of slate had been specified. The latter serve also to provide easy access levels from which all parts of the interior may be reached by interconnecting stairways. Less easily explained are the eight series of five segmental arches each, which were inserted between the major ribs, and which pass through the minor ribs; these are placed radially with reference to the hypothetical center of the dome. The real effectiveness of these arcuated members has yet to be discerned. A further binding feature in the form of an armature of chestnut beams was introduced at a height of about 10 feet above the first circular passage. The program required five of these, but their utility would have been questionable above the haunch of the dome. As additional cinctures, chains were embedded in the solid masonry of the base. The lantern is only casually mentioned in the specifications. This feature



S. Maria del Fiore, Florence
Diagram showing position and construction of lantern and treatment of crown and oculus of dome

was not a new one, but had never been given its adequate scope. There were then extant praiseworthy, though hesitating, examples in Pisa and Siena, as well as in Florence. The lantern should, in this case, be considered a necessary terminal feature for so large and massive a silhouette. It also demanded greater projection of the major ribs on the exterior, and so established a fine unity of leading lines, and more especially of structural design.

New conferences held in 1424–25 led to a new set of specifications. Ghiberti's name still appears, and he is still credited, as was the case throughout his connection with the work, with a higher stipend than Brunelleschi. The new program required the small circular openings now appearing in the dome, it being stated that these were not only for light, but chiefly as points of support for the scaffoldings of mosaicists. Experience demonstrated from time to time in course of construction that changes were feasible or advisable in the interests of better construction and of economy of materials. What is more, Brunelleschi, being himself responsible chiefly for both specifications and execution, was permitted to use considerable initiative.

The finished dome was dedicated in August, 1436, but the lantern, for the design of which Brunelleschi and Ghiberti were again in competition, was not completed until 1467. An arcaded loggia around the base of the dome was begun during the fifteenth century by Baccio d'Agnolo; it was completed along one side of the octagon when the undeserved ridicule of Michelangelo caused it to be abandoned. It should be noted that after 1433 Ghiberti's name no longer appears in the accounts of regular expenditures. In 1443 we find record that Filippo Brunelleschi is to be declared architect of the duomo for life on condition that the lantern be satisfactorily completed, a ridiculous stipulation in view of his services up to that time. The honor was to be accorded him, says the Latin text, for the building of the dome and the lantern. Thus the lion and the mouse were brought together as equals. And Brunelleschi had been in sole charge of the works since 1423! He died in 1446, twenty years before the lantern was finished, and so forfeited the nominal honor which the quibbling Committee of Four had brought itself to concede.

S. Maria del Fiore, Florence
Half section and half elevation of lantern. (From Sgrilli)

Bibliographic Note. Since it was not possible to include in the foregoing any deeper critical discussion of the dome fabric, nor to give its history in detail, the following list of works of reference is added for the convenience of those interested:

Anderson: Architecture of the Renaissance in Italy, London, 1909; Cummings: History of Architecture in Italy, New York, 1901; Durm: Die Baukunst der Renaissance in Italien, Leipzig, 1914 (*in* Handbuch der Architektur); Durm: Zwei Grossconstructionen der Renaissance in Italien, *in* Zeitschrift für Bauwesen, 1887; Fabriczy: Filippo Brunelleschi, sein Leben und seine Werke, Stuttgart, 1802; Frey: Le vite di Filippo Brunelleschi, scultore e architetto fiorentino, scritto da Giorgio Vasari e da anonimo autore (Manetti), Berlin, 1887; Frey: Vita di Lorenzo Ghiberti, Berlin, 1886; Guasti: La cupola di Santa Maria del Fiore, Firenze, 1857; Guasti: Santa Maria del Fiore, la construzione della chiesa e del campanile secondo i documenti, Firenze, 1887; Moore: Character of Renaissance Architecture, New York, 1905; Nardini: Filippo di ser Brunellesco e la cupola del Duomo di Firenze, Livorno, 1885; Nelli: Discorsi di architettura, Firenze, 1753, with which is bound: Cecchini: Due discorsi sopra la cupola di Santa Maria del Fiore; Norton: Church Building in the Middle Ages, New York, 1880; Sgrilli: Descrizione e studi dell' insigne fabbrica di S. Maria del Fiore, etc., Firenze, 1783; Simpson: History of Architectural Development, Vol. 3, New York, 1911; Wenz: Die Kuppel des Domes Santa Maria del Fiore zu Florenz, Berlin, 1901.

EDITORIAL COMMENT AND NOTES FOR THE MONTH

THE architect is primarily an artist no less than the painter or sculptor. His first thought in creating the design for a building is to have it possess certain qualities of beauty, to accord with the vision which his imagination brings before his eye. He conceives his building in mass with bold shadows and high lights to screen the detail, much as the sculptor shapes the contour and mass of a sculptural group. Unlike the painter and sculptor, however, the architect is not always permitted to carry to completion his design by his own personal effort, nor is he free to make it represent only his artistic ideas. He is surrounded from the first with considerations which impose severe handicaps upon creative ability.

The actual production of architecture entails the labor of many more persons than that of the designer, yet his must be the guiding hand of all if the result achieved is to be a correct and sympathetic execution of his design. Clients are in general concerned only with securing a useful and efficient building to meet their needs, and consequently look upon the architect only as a necessary medium through whom they can best secure what they want. The architect is rarely consulted as an artist; he is too often employed primarily to direct practical operations in a practical way. Since there are, strictly speaking, no patrons of architecture as there are of the other arts, and but few clients who build with the principal thought of giving concrete expression to an architectural design, it devolves upon the architect alone, in the average instance, to find the enthusiasm and desire to make a building beautiful. He is by force of these circumstances compelled to approach his art in a spirit of compromise: on the one hand he has his ambitions as an artist to satisfy; on the other he has certain practical considerations of planning, accommodation, and cost, determined by his client, to satisfy. He plays, therefore, a difficult rôle even when he is fortunate enough to have a client who recognizes that profit and pleasure may be derived from an architecturally beautiful building. Even then many of his reasons for employing certain methods of treatment or securing scale among component parts must be misunderstood because of the lack of a complete knowledge of architecture on the part of his clients.

In the designing of residences he more frequently meets with appreciative clients than in other classes of work, but even here conditions exist which are a source of much distress to his artistic predilections. The designing of a home has all the elements of interest in it that appeal to the creative imagination of the artist, and what architect does not experience pleasure when he thinks of the country house that he might design under ideal conditions? With the attraction that residential design has for the architect it would seem that our domestic architecture ought to be of a high order. It is given to but few designers, however, to work under ideal conditions for the creation of domestic architecture, and this may in great measure be taken as the reason for the lower order of architecture that prevails in many instances to-day.

In the design of important residences where the architect meets with fewer restrictions of severely practical nature he is able to express in his buildings the personal tastes of his clients as he interprets them and provide a background for their lives that is in perfect accord with their individuality.

The well informed and appreciative client is eager that not alone in the design of the exterior of his house shall the architect be the arbiter as to what constitutes propriety and architectural excellence — he desires the latter's influence to extend to the design of each individual room and to the selection of the furniture and fittings that are to complete its livableness. It is to be regretted that such appreciation of the architect's ability and respect and admiration for his art are not manifested on the part of more clients, for with them the quality of American architecture would be immeasurably increased and the examples of well designed interiors utterly spoiled by association with inappropriate, if not ugly, furniture, and hangings would be less frequent.

Architects, however, have the opportunity to influence these conditions for the better, and they should make a special effort, in justice to their own work and the standards of their profession, to educate their clients to a fuller appreciation of the dependence of the architectural design of an interior upon its proper furnishing and decoration to make a completely satisfactory result. Only with such a spirit on the part of the client and a desire on the architect's part to furnish his advice in matters of furnishing after the structure has been completed can be sure that his finished work will truly represent him.

WHEN the large auditorium at the University of Illinois was built in 1908 it proved to be unsatisfactory in its acoustical properties. Audiences found it difficult to hear speakers owing to marked reverberation and echoes. Dr. F. R. Watson of the Physics Department and James M. White, Supervising Architect, undertook to correct this fault by conducting a systematic investigation involving a long series of experiments. "Bundles" of sound were projected in different directions and the paths of these were carefully traced. Various instruments, such as a ticking watch, a hissing arc lamp, and megaphones were employed, and curtains and draperies were hung at critical points suggested by the diagnosis.

Certain of the walls were then covered with hairfelt mounted on thin furring strips, with the result that at present a speaker may be heard distinctly by auditors in the most distant seats of the large building.

The investigations are described in detail in an illustrated booklet issued by the Engineering Experiment Station as Bulletin No. 87. Copies may be had by addressing W. F. M. Goss, Director, Urbana, Ill.